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ABSTRACT

A study was made of Formula Phonics Reading Chain Programs in six California elementary schools to determine whether these programs replicated, in both form and educational outcome, the model program. On-site visits were made to evaluate program components and teaching strategies. Student achievement data provided by the schools, the districts, and the state department of education were evaluated to determine if (1) reading comprehension scores were higher than vocabulary scores; (2) total reading scores were higher than grade norms; (3) total reading scores in the upper elementary grades were as far above grade norms as were total reading scores in the primary classes; and (4) if severe reading retardation were to be found in less than five percent of upper elementary students and mild reading retardation in less than ten percent. Results suggested that Formula Phonics Reading Chain Programs have been successfully replicated at each of the six schools and that there has been no regression of achievement patterns obtained by the model school. (Author/AA)

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REPLICATING THE FORMULA PHONICS READING CHAIN PROGRAM SCHOOL YEAR 1975-1976

Edward O. Vail

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CS003406

Replicating The Formula Phonics Reading Chain Program

School Year 1975-1976

Model Program

Orcutt, California Union School District
Patterson Road Elementary School

Two-Year Replication Sites

Redlands, California Unified School District
Mentone Elementary School

Santa Barbara, California School District
Roosevelt Elementary School

One-Year Replication Sites

Atascadero, California Unified School District
Lewis Avenue School
Monterey Road School
Santa Margarita School
Santa Rosa School

Abstract

A study was made of Formula Phonics Reading Chain Programs in six California elementary schools to determine whether these programs replicated, in both form and educational outcome, the nationally honored model program at Patterson Road School in Orcutt, California. On-site visits were made to the replication schools to evaluate program components and teaching strategies. Student achievement data provided by the schools, the districts, and the California State Department of Education were evaluated to determine if scores from the replication programs met four criteria:

- Reading Comprehension scores are higher than Reading Vocabulary scores, no matter how much higher than grade norms the Vocabulary scores may be.
- Total Reading scores are higher than grade norms.
- Total Reading scores in upper elementary classes (4, 5, 6) are as far above class grade norms as are Total Reading scores for primary (2, 3) classes.
- After the program's second year severe reading retardation is found in less than 5% of the upper elementary students and mild reading retardation in less than 10% of these students.

To determine if the Hawthorne Effect, or any other factor, had led to an erosion of student achievement patterns at the model school, scores for 1975-1976 were compared with those of 1974-1975.

The study suggests that Formula Phonics Reading Chain Programs have been successfully replicated at each of the six schools and that there has been no regression of achievement patterns at the model school.

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Replicating The Formula Phonics Reading Chain Program School Year 1975-1976 by Edward O. Vail

Background

This study was undertaken to determine whether it is possible to replicate, both in form and in outcome, one of America's most successful reading programs. This program, the Formula Phonics Reading Chain Program at Patterson Road School in Orcutt, California, was cited in the U.S.O.E. Right to Read's study in 1973-74 to locate "the most successful reading programs" in the country. Following this honor, two dissemination instruments were produced to acquaint the educational community with the program. These are a 48-page study, *The Formula Phonics Reading Chain Program at Patterson Road Elementary School*[1] and a 55-minute, color television production, *A Video Trip to Patterson Road School.* The study may be found in all of the ERIC microfiche collection depositories, and many of these institutions also have video cassettes of the television program.

All of the materials used in the original program at Patterson Road Elementary School, and which are used today in program replication, were produced and are distributed by Integrative Learning Systems of Glendale, California. These include a series of video programs used for program design, staff development, and to fund all target students with the same phonetic information and discussion procedures; a reading-oral language arts teaching manual; a spelling-written language arts teaching manual; a student reading and a student spelling workbook; and a set of four poster wall charts.

To replicate Formula Phonics Reading Chain Programs in a school other than Patterson Road called for a substantial restructuring of the school; retraining of virtually all faculty so that they were able to employ a comprehensive reading-information processing system with any group of the school's children; standardizing the basic phonetic-reading processing capabilities of all target students; and markedly revising curricular offerings. The brief description which follows is intended to acquaint the reader with the workings of a Formula Phonics Reading Chain Program. A detailed description of the model program at Patterson Road Elementary School is found in the 1975 study.[2]

The Program—An Overview

The program consists of two elements: the *delivery system* which includes program design, staff development, administration and coordination, monitoring, and evaluation; and, the *teaching system* which includes how the children are taught and what they are taught. As the name implies, a Reading Chain consists of a number of ungraded groups of youngsters of about the same ability level in reading and language development. The groups in a Reading Chain all meet during the same period of time every day and work together for about 45 minutes. Generally, all of a school's second through sixth or eighth graders participate in the program. Most schools reduce group size by employing a staggered day schedule or some similar technique in order to have two distinct Reading Chains.

Teachers are originally assigned to reading groups by chance and thereafter rotate groups every five or six weeks. In the Reading Chain Dialog Groups, and in their regular classrooms as well, all teachers employ the same basic Formula Phonics teaching strategies. These skills are learned by watching and processing the staff development and student video programs, by reading and then discussing the two teaching manuals, and by employing these skills in their daily teaching.

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[1] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, CA. 1975. Available through ERIC Document Reproduction Service, ED 112 367.

[2] *Ibid.* pp. 9-10. Also found in the appendix of this study.

Teaching the same decoding and spelling system and developing the same body of information processing skills in all of a school's students—whether they be second or eighth graders, gifted or slow, native speakers of English or linguistically different, rich or poor, or normal or exceptional—is made possible because the first step in the program is having every student view and process the same ten video programs. This procedure, which is accomplished in about ten to fifteen class periods for most students, somewhat standardizes each pupil's store of basic phonetic information.

The spelling and decoding formulas are retrieval mechanisms which students are taught to use to tap the store of language information presented by the video programs and which they knew previously. The major reason for initially funding all students with the same body of phonetic information and basic language processing procedures is to permit teachers to place their students in a curriculum written at the instructional level as soon as they form into groups. In the Reading Chain Dialog Groups, and later in the classroom, students read aloud, discuss, write about, evaluate, and otherwise process written material which is chosen so that every day each group is encountering new vocabulary, writing styles, concepts, information, attitudes, and ideas.

If there is a need to decode or to spell any words which are encountered in what is being read, teachers help the groups learn to use the decoding and spelling formulas to recall, apply, and synthesize the phonetic information learned from the video programs. This is done consistently by every teacher until every student develops a personalized decoding and spelling system. However, each day the greater part of the time in the reading groups is given over to discovering, clarifying, and learning the new vocabulary, information, and ideas which the curriculum provides. During the remainder of the school day, when students meet with their regular teachers in heterogeneously grouped classrooms, the same language processing procedures are used to teach all of them from their correct grade level content area textbooks.

Once during each five or six week cycle, every teacher is freed to visit the other reading groups in the Reading Chain. Staff meets in bi-monthly or weekly in feedback sessions to critique their program, discuss objectives, and consider the movement of students to groups of higher ability. Record keeping is accomplished in part by employing a visual display of the Reading Chain with a card color coded by grade for each student.

Nature of the Study

To determine whether Formula Phonics Reading Chain Programs were being replicated in schools other than Patterson Road, it was first necessary to visit a number of Reading Chain schools to assure that their programs—in terms of design and teaching—were consonant with that at Patterson Road School. Second, it was necessary to evaluate the test data from the replication schools to determine if those scores paralleled student achievement scores at Patterson Road School. Finally, the 1975-76 test data from Patterson Road School was studied to determine whether the achievement scores reported in the 1974-75 study had been replicated.

It was decided to limit the study to California schools because that state's Department of Education's yearly California Assessment Program (C.A.P.) provides comparable achievement and background information for every school in the state. After on-site visits had confirmed that their programs did follow Formula Phonics Reading Chain guidelines which are set out in the replication materials (see Table II), six schools in addition to Patterson Road School were chosen for study.[3]

Two of these schools had completed two years in the program in June, 1976, when this study was undertaken. These schools are:

Mentone Elementary School in the Redlands Unified School District. C.A.P. data shows that Mentone School's socio-economic index state percentile ranking is 53 points below that at Patterson Road. Mentone serves a student minority population of 23%, while Patterson Road serves a 5% minority population. Some 304 students in grades two through six were studied at Mentone School.

[3] Copies of these studies are found in the appendix of this study.

Roosevelt Elementary School in the Santa Barbara School District. The school is desegregated by pairing with a primary school (K-2) so the student population is bi-modal in terms of social class, ethnicity, language, and cultural background. The total minority population is 46% (40% Spanish surnamed) and the socio-economic index state percentile ranking is 47. Some 285 students in grades three through six were studied at Roosevelt School.

The remaining four schools are all in the same school district, Atascadero Unified, and had completed between 9 and 11 months in the program when school ended in June, 1976. These schools are:

Lewis Avenue School. This is a large Title I school whose socio-economic index state percentile ranking is 33. Some 347 students in grades two through six were studied at Lewis Avenue School.

Monterey Road School. This is a large, above average income school whose socio-economic index state percentile ranking is 83. Some 224 students in grades three through six were studied at Monterey Road School.

Santa Margarita School. This is a small, semi-rural Title I school whose socio-economic index state percentile ranking is 66. Some 177 students in grades two through six were studied at Santa Margarita School.

Santa Rosa School. This is a large school whose socio-economic index state percentile ranking is 57. Some 181 students in grades four through six were studied at Santa Rosa School.

District-wide student ethnicity in the Atascadero schools is less than 8%. Of the four target schools, Santa Margarita has the highest minority population, 8.8%.

The four Atascadero schools provide an opportunity to evaluate a district-wide Formula Phonics Reading Chain Program. This program differs from that at Mentone and Roosevelt Schools in that the decision to adopt the program was made at the district rather than school level. The district office also provides the program's over-all administration, support, on-going staff development, maintenance, and evaluation.

Results

Table I may be used to compare the replication schools with one another and with the model school, Patterson Road School. The background data is taken from the C.A.P. report for school year 1975-76. The remaining information is found in the different studies.

Table I
School Profiles

School and District	Grades Involved	Months in Program	Reading Test	Initial Reading Program	% Minority	%ile A.F.D.C.*	%ile Bilingual*	%ile S.E.S. Index*	%ile Mobility*
Patterson Road (Orcutt)	**2–6**	**37**	***C.T.B.S.***	***Lippincott Formula Phonics***	**5.4**	**16**	**26**	**77**	**17**
Mentone (Redlands)	2–6	18	*Slosson*	*Bannantyne Lippincott Formula Phonics*	23.0	60	71	24	17
Roosevelt (Santa Barbara)	3–6	18	*M.A.T.*	*Open Court Bank Street*	46.0	69	85	47	99**
Lewis Avenue (Atascadero)	2–6	8	*C.A.T. C.T.B.S.*	*Total Reading*	6.9	52	9	33	51
Monterey Road (Atascadero)	3–6	11	*C.T.B.S.*	*Initial Teaching Alphabet*	5.9	38	1	83	76
Santa Margarita (Atascadero)	2–6	8	*C.A.T. C.T.B.S.*	*Phonovisual*	8.8	34	8	66	68
Santa Rosa (Atascadero)	4–6	8	*C.T.B.S.*	*Read, Linguistic Approach to Reading*	6.3	46	37	57	73

*California Assessment Program. Grades two and three, May, 1976—California State Percentile rank for all schools
**No second grade, so computer readout shows 99% mobility.

EACH ONE OF THE SIX REPLICATION SCHOOLS LISTED IN TABLE I HAS A FORMULA PHONICS READING CHAIN PROGRAM WHICH GENERALLY INCLUDES ALL OF THE MAJOR ELEMENTS FOUND IN THE PROGRAM AT THE MODEL SCHOOL, PATTERSON ROAD SCHOOL.

Eighteen elements found in the program at Patterson Road Elementary School are considered by the program's authors to be particularly important to the success of any Formula Phonics Reading Chain Program. Table II shows which of these elements were present at the six replication sites during school year 1975-1976. It should be noted that the programs at Mentone and Roosevelt Schools started before the Formula Phonics program design-staff development video programs were completed and before the spelling-writing component was shifted from the classrooms to the ability grouped Reading Chain.

Table II
Program Replication in Terms of Following the Formula Phonics Reading Chain Guidelines

	Patterson Road	Lewis Avenue	Mentone	Monterey Road	Roosevelt	Santa Margarita	Santa Rosa
Staff has viewed and processed all video programs and read and discussed both teaching manuals.	All	All	Most	All	Most	All	All
Teachers rotate groups every 5 or 6 weeks.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Teachers "Walk through the Chain" to visit other groups.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Staff meets in a "feedback circle" bimonthly.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Visual display of the Reading Chain is kept current and used frequently.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wall charts are mounted so as to be visible to both teacher and students.	Most	Most	Most	Most	Most	Most	Most
Students and teacher are seated in a discussion semi-circle so that eye contact can be made among all.	All	Most	All	Most	All	Most	Most
Principal is the program's educational leader.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-1 teachers help prepare students for placement in the Reading Chain.	Yes	Yes	Yes	No	No	Yes	No
Substitute teachers and aides are trained in Formula Phonics teaching strategies.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
There is only one reading group in every teacher station during each dialog session.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All regular students in Grades 2 or 3 upward participate in the Reading Chain program.	Yes	Yes	Yes	No	Yes	Yes	No
Educable special education students participate in the Reading Chain program.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reading materials are at each group's instructional level.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Teachers consistently employ Formula Phonics decoding strategies.	All	All	All	All	All	All	All
Teachers consistently employ Formula Phonics encoding strategies.	All	Some	Most	Some	Few	Some	Some
Teachers consistently employ articulated (oral-written) language processing strategies in clarifying curriculum.	All	Some	Most	Some	Some	Some	Some
Formula Phonics strategies are used in classrooms to process content area materials and texts.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

TABLE II SHOWS WHICH OF EIGHTEEN MAJOR PROGRAM ELEMENTS FOUND IN THE MODEL SCHOOL WERE ALSO PRESENT IN THE PROGRAMS AT THE SIX REPLICATION SCHOOLS. WHEN THEY WERE OBSERVED, IT WAS FOUND THAT VIRTUALLY ALL OF THE PROGRAM DESIGN-STAFF DEVELOPMENT ELEMENTS HAD BEEN COMPLETED OR WERE PRESENT. EVERY TEACHER WAS OBSERVED USING THE SYSTEM'S DECODING-DISCUSSION-QUESTIONING TECHNIQUES, AND A CONSIDERABLE NUMBER WERE ALSO BEGINNING TO INTEGRATE THE SPELLING-WRITING PROCEDURES INTO THEIR TEACHING IN THE READING CHAIN.

Pre Test 9/74 C.T.B.S. Form S (Voc., Comp., Total Rdg.)
Post Test 5/75 C.T.B.S. Form S (Total Battery)
I.Q. Data 5/75 Short Form Test of Academic Aptitude

Date of Study: 7/75

Table III
Learner Verification Study—Summary Sheet
Patterson Road Elementary School

GRADE 2

	N =	Grade Norm	Total Reading	Total Language	Total Mathematics	Total Battery	Total Reading Q 1	Total Reading Q 2	Total Reading Q 3
Pre Test	40	2.1	2.5	N.A.	N.A.	N.A.	1.9	2.3	3.2
Post Test	**40**	**2.8**	**3.4**	**3.5**	**3.1**	**3.2**	**2.8**	**3.7**	**4.1**
Difference			+0.9	—	—	—	+0.9	+1.4	+0.9

	N =	I.Q. Lang.	I.Q. Non-Lang.	I.Q. Total	Grade Norm	Rdg. Voc.	Rdg. Comp.	Total Rdg.	Total Lang.	Total Math	Ref. Skills	Science	Soc. Study	Total Rdg. Q1	Total Rdg. Q2	Total Rdg. Q3
GRADE 3 PRE TEST	49	N.A.	N.A.	N.A.	3.1	3.2	3.0	3.1	N.A.	N.A.	N.A.	N.A.	N.A.	2.0	3.0	3.8
GRADE 3 POST TEST	**49**	**N.A.**	**N.A.**	**N.A.**	**3.8**	**5.0**	**5.9**	**5.3**	**4.8**	**4.6**	**4.7**	**4.8**	**4.9**	**4.1**	**4.8**	**6.3**
GRADE 3 DIFFERENCE	—	N.A.	N.A.	N.A.	—	+1.8	+2.9	+2.2	—	—	—	—	—	+2.1	+1.8	+2.5

	N =	I.Q. Lang.	I.Q. Non-Lang.	I.Q. Total	Grade Norm	Rdg. Voc.	Rdg. Comp.	Total Rdg.	Total Lang.	Total Math	Ref. Skills	Science	Soc. Study	Total Rdg. Q1	Total Rdg. Q2	Total Rdg. Q3
GRADE 4 PRE TEST	53	—	—	—	4.1	4.2	4.8	4.4	N.A.	N.A.	N.A.	N.A.	N.A.	3.4	3.8	5.1
GRADE 4 POST TEST	**53**	**106**	**107**	**107**	**4.8**	**5.7**	**7.0**	**6.3**	**5.5**	**5.0**	**5.9**	**6.2**	**6.4**	**4.8**	**6.3**	**7.8**
GRADE 4 DIFFERENCE	—	—	—	—	—	+1.5	+2.2	+1.9	—	—	—	—	—	+1.4	+2.5	+2.7

	N =	I.Q. Lang.	I.Q. Non-Lang.	I.Q. Total	Grade Norm	Rdg. Voc.	Rdg. Comp.	Total Rdg.	Total Lang.	Total Math	Ref. Skills	Science	Soc. Study	Total Rdg. Q1	Total Rdg. Q2	Total Rdg. Q3
GRADE 5 PRE TEST	71	—	—	—	5.1	4.9	4.5	4.7	N.A.	N.A.	N.A	N.A.	N.A.	3.4	4.3	5.7
GRADE 5 POST TEST	**71**	**105**	**108**	**107**	**5.8**	**7.3**	**7.7**	**7.5**	**6.9**	**6.2**	**7.7**	**7.8**	**7.7**	**5.9**	**7.2**	**8.7**
GRADE 5 DIFFERENCE	—	—	—	—	—	+2.4	+3.2	+2.8	—	—	—	—	—	+2.5	+2.9	+3.0

	N =	I.Q. Lang.	I.Q. Non-Lang.	I.Q. Total	Grade Norm	Rdg. Voc.	Rdg. Comp.	Total Rdg.	Total Lang.	Total Math	Ref. Skills	Science	Soc. Study	Total Rdg. Q1	Total Rdg. Q2	Total Rdg. Q3
GRADE 6 PRE TEST	58	—	—	—	6.1	6.9	7.0	7.0	N.A.	N.A.	N.A.	N.A.	N.A.	4.7	6.3	9.6
GRADE 6 POST TEST	**58**	**104**	**106**	**106**	**6.8**	**8.3**	**9.1**	**8.8**	**7.4**	**7.3**	**9.2**	**8.3**	**8.9**	**6.5**	**8.7**	**11.1**
GRADE 6 DIFFERENCE	—	—	—	—	—	+1.4	+2.1	+1.8	—	—	—	—	—	+1.8	+2.4	+1.5

While it is rather easy to duplicate a successful reading program in different schools so far as program design, staff development, curricular materials, and teaching techniques are concerned, there is little in the literature to suggest that the achievement data from such a program is as easy to replicate.

Table III is taken from the 1974-75 study of the Formula Phonics Reading Chain Program at Patterson Road School. In examining this table and other data from the model program it was possible to isolate certain factors which the achievement scores from the replication schools should also contain. Generally, if replication is to be claimed, these factors should obtain no matter how dissimilar the teaching staffs and student populations in the replication sites are from those found at Patterson Road School. These four factors are:

1. Reading Comprehension scores are higher than Reading Vocabulary scores no matter how much higher than grade norms the vocabulary scores may be.
2. Total Reading scores are higher than grade norms.
3. Total Reading scores in upper elementary classes (4, 5, 6) are as far above class grade norms as are Total Reading scores for primary (2, 3) classes.
4. After the program's second year severe reading retardation is found in less than 5% of the upper elementary students and mild reading retardation in less than 10% of these students.

Table IV treats with the *first* of the *factors* necessary to claim replication—*that Reading Comprehension scores will be higher than are Reading Vocabulary scores.* Baseline data from the first Patterson Road School study is shown first. This is followed by the 1976 data from that school and then data from each of the six replication sites.

Table IV
Reading Comprehension Scores Compared With Reading Vocabulary Scores

School	Date of Test	Test	Grade Two Voc.	Comp.	Diff.	Grade Three Voc.	Comp.	Diff.	Grade Four Voc.	Comp.	Diff.	Grade Five Voc.	Comp.	Diff.	Grade Six Voc.	Comp.	Diff.
Patterson Road	**5-75**	*CTBS*	**N.A.**			**5.0**	**5.9**	**+0.9**	**5.7**	**7.0**	**+1.3**	**7.3**	**7.7**	**+0.4**	**8.3**	**9.1**	**+0.8**
Patterson Road	5-76	*CTBS*	N.A.			4.9	5.4	+0.5	6.3	7.2	+0.9	7.5	8.1	+0.6	8.4	8.6	+0.2
Mentone	6-76	*Slosson*	N.A.			N.A.			N.A.			N.A.			N.A.		
Roosevelt	5-76	*MAT*	N.A.			4.3	4.5	+0.2	5.2	5.0	−0.2	6.2	6.5	+0.3	6.9	7.3	+0.4
Lewis Avenue	5-76	*CAT CTBS*	3.4	3.1	−0.3	4.6	4.8	+0.2	5.1	5.0	−0.1	6.2	6.6	+0.4	7.1	7.3	+0.2
Monterey Road	5-76	*CTBS*	N.A.			5.2	6.2	+1.0	5.7	6.5	+0.8	7.1	8.0	+0.9	8.1	8.7	+0.6
Santa Margarita	5-76	*CAT CTBS*	3.4	3.7	+0.3	4.4	4.4	0.0	N.A.			N.A.			N.A.		
Santa Rosa	5-76	*CTBS*	N.A.			N.A.			5.2	5.2	0.0	6.5	7.3	+0.8	7.8	8.4	+0.6
Replication Schools			N = 99			N = 239			N = 218			N = 264			N = 283		

TABLE III SHOWS THAT IN 1975-76, STUDENTS AT PATTERSON ROAD SCHOOL CONTINUED TO SCORE HIGHER IN READING COMPREHENSION THAN IN READING VOCABULARY. IN THE REPLICATION SCHOOLS THE SAME PATTERN IS FOUND IN 13 OF 18 (72%) CLASSES; WHILE IN TWO CLASSES (11%) THE SCORES ARE THE SAME; AND IN THREE CLASSES (17%) THE VOCABULARY SCORES ARE HIGHER.

Table V treats with the *second* and *third factors* which characterize the Patterson Road School data —that *Total Reading scores are significantly higher than grade norms* and that *Total Reading scores for upper elementary students are as far above grade norms as are Total Reading scores for primary students.* The same order of display as is found in Table V is used in Table IV.

Table V
Grade Equivalent Scores in Total Reading Compared With Grade Norms

School	Date of Test	Test	Grade Two Norm	Grade Two T.R.	Grade Two Diff.	Grade Three Norm	Grade Three T.R.	Grade Three Diff.	Grade Four Norm	Grade Four T.R.	Grade Four Diff.	Grade Five Norm	Grade Five T.R.	Grade Five Diff.	Grade Six Norm	Grade Six T.R.	Grade Six Diff.
Patterson Road	**5-75**	***CTBS***	**2.8**	**3.4**	**+0.6**	**3.8**	**5.3**	**+1.5**	**4.8**	**6.3**	**+1.5**	**5.8**	**7.5**	**+1.7**	**6.8**	**8.8**	**+2.0**
Patterson Road	5-76*	*CTBS*	2.6	3.2	+0.6	3.6	5.1	+1.5	4.8	6.8	+2.0	5.8	7.8	+2.0	6.8	8.5	+1.7
Mentone	6-76	*Slosson*	2.9	4.7	+1.8	3.9	5.2	+1.3	4.9	7.5	+2.6	5.9	8.2	+2.3	6.9	8.8	+1.9
Roosevelt	5-76	*MAT*		N.A.		3.8	4.3	+0.5	4.8	5.1	+0.3	5.8	6.3	+0.5	6.8	7.3	+0.5
Lewis Avenue	5-76	*CAT CTBS*	2.8	3.1	+0.3	3.8	4.7	+0.9	4.8	5.1	+0.3	5.8	6.3	+0.5	6.8	7.3	+0.5
Monterey Road	5-76	*CTBS*		N.A.		3.8	5.6	+1.8	4.8	6.0	+1.2	5.8	7.5	+1.7	6.8	8.5	+1.7
Santa Margarita	5-76	*CAT CTBS*	2.8	3.8	+1.0	3.8	4.3	+0.5	4.8	4.7	−0.1	5.8	6.8	+1.0	6.8	7.3	+0.5
Santa Rosa	5-76	*CTBS*		N.A.			N.A.		4.8	5.2	+0.4	5.8	6.8	+1.0	6.8	8.2	+1.4
Replication Schools' Average Months Above Norms			N = 138		**+1.0**	N = 292		**+1.0**	N = 291		**+0.8**	N = 346		**+1.2**	N = 382		**+1.1**

*Second and Third Graders at Patterson Road School were tested in March, 1976; Fourth through Sixth Graders were tested in May.

TABLE IV SHOWS THAT AFTER 37 MONTHS IN THE FORMULA PHONICS READING CHAIN PROGRAM, STUDENTS AT PATTERSON ROAD SCHOOL CONTINUED TO POST READING ACHIEVEMENT SCORES WHICH ARE SUBSTANTIALLY HIGHER THAN THEIR GRADE NORMS. FURTHER, FOURTH, FIFTH, AND SIXTH GRADERS IN THE CURRENT STUDY SCORED SUBSTANTIALLY HIGHER ABOVE GRADE NORMS THAN DID SECOND AND THIRD GRADERS.

IN THE SIX REPLICATION SCHOOLS, SCORES FOR 1,449 SECOND THROUGH SIXTH GRADERS WERE STUDIED. IN 25 OF 26 CLASSES (96%) TOTAL READING SCORES WERE THREE MONTHS OR MORE ABOVE GRADE NORMS. THE AVERAGE CLASS SCORED 11 MONTHS HIGHER IN TOTAL READING THAN ITS GRADE NORM. STUDENTS IN 26 CLASSES IN THE REPLICATION SCHOOLS HAD AVERAGE TOTAL READING SCORES TEN MONTHS HIGHER THAN THEIR RESPECTIVE GRADE NORMS WHEN THEY WERE TESTED. SECOND AND THIRD GRADERS SCORED AT THE MEAN; FOURTH GRADERS SCORED TWO MONTHS BELOW; FIFTH GRADERS SCORED TWO MONTHS ABOVE; AND SIXTH GRADERS SCORED ONE MONTH ABOVE.

Table VI treats with the *fourth factor—that severe reading retardation is found in less than 5% of the upper elementary students and mild reading retardation is found in less than 10% of these students when they participate in Formula Phonics Reading Chain Programs.* For the purpose of this study it is accepted that a student who scores two years or more below his grade norm on a standardized reading test is *severely retarded* in reading ability, while a student who scores between ten and nineteen months below his grade norm on a standardized reading test is *mildly retarded* in reading. It will be noted that these definitions make no exception for a student's social class or linguistic, cultural, or ethnic differences. What is being asked is, "How well does each student score on a standardized reading test when measured against the same standard?"

N = Number
M = MILD Reading Retardation
(students scoring 10 to 19 months below their grade norms)
S = SEVERE Reading Retardation
(students scoring two years or more below their grade norms)

Table VI
Incidence of Mild and Severe Reading Retardation in Formula Phonics Reading Chain Schools

School	Test Date	State %ile Rankings A.F.D.C.	Bilingual	Grade Two N=	S	%	M	%	Grade Three N=	S	%	M	%	Grade Four N=	S	%	M	%	Grade Five N=	S	%	M	%	Grade Six N=	S	%	M	%	Totals N=	S	%	M	%
Patterson Road	5-75	–	–	40	0	0	1	2.5	48	1	2.1	1	2.1	51	1	2.0	5	9.8	72	1	1.4	3	4.2	58	2	3.4	9	15.5	269	5	1.9	19	7.1
Patterson Road	5-75	16	26	46	1	2.2	5	10.9	57	1	1.8	5	8.8	40	0	0.0	5	12.5	43	1	2.3	3	7.0	61	4	6.6	5	8.2	247	7	2.8	23	9.3
Two Year Programs																																
Mentone	6-76	60	71	46	1	2.2	3	6.5	60	1	1.7	4	6.7	50	0	0.0	3	6.0	44	1	2.3	2	4.5	68	1	1.5	3	4.4	268	4	1.5	15	5.6
Roosevelt	5-76	69	85	–	–	–	–	–	76	5	6.6	7	9.2	58	2	3.4	12	20.7	66	6	9.1	7	10.6	83	6	7.2	15	18.0	283	19	6.7	41	14.5
TOTAL Two Year Schools				**46**	**1**	**2.2**	**3**	**6.5**	**136**	**6**	**4.4**	**11**	**8.0**	**108**	**2**	**1.9**	**15**	**13.9**	**110**	**7**	**6.4**	**9**	**8.2**	**151**	**7**	**4.6**	**18**	**11.9**	**551**	**23**	**4.2**	**56**	**10.1**
One Year Programs																																
Lewis Avenue	5-76	52	9	61	2	3.3	11	18.0	63	0	0.0	11	17.5	60	3	5.0	15	25.0	80	14	17.5	7	8.8	83	15	12.5	17	20.5	347	34	9.8	61	17.6
Monterey Road	5-76	38	1	–	–	–	–	–	64	1	1.6	4	6.3	45	1	2.2	3	6.7	55	3	5.5	2	3.6	59	5	8.5	5	8.5	223	10	4.5	14	6.3
Santa Margarita	5-76	34	8	38	0	0.0	2	5.3	38	2	5.3	8	21.1	25	2	8.0	7	28.0	35	4	11.4	2	5.7	54	6	11.1	8	14.8	190	14	7.4	27	14.2
Santa Rosa	5-76	46	37	–	–	–	–	–	–	–	–	–	–	50	1	2.0	0	0.0	72	10	13.9	5	6.9	56	3	5.4	6	10.7	178	14	7.9	11	6.2
TOTAL–One Year Schools				**99**	**2**	**2.0**	**13**	**13.0**	**165**	**3**	**1.8**	**23**	**13.9**	**180**	**7**	**3.9**	**25**	**13.9**	**242**	**31**	**12.8**	**16**	**6.6**	**252**	**29**	**11.5**	**36**	**14.3**	**938**	**72**	**7.7**	**113**	**12.0**
Totals–Six Replication Schools																																
TOTALS	**1976**			**145**	**3**	**2.1**	**16**	**11.0**	**301**	**9**	**3.0**	**34**	**11.3**	**288**	**9**	**3.1**	**40**	**13.9**	**352**	**38**	**10.8**	**25**	**7.1**	**403**	**36**	**8.9**	**54**	**13.4**	**1489**	**95**	**6.4**	**169**	**11.3**
Totals–All Seven Schools in This Study																																
TOTALS	**1976**			**191**	**4**	**2.1**	**21**	**11.0**	**358**	**10**	**2.8**	**39**	**10.9**	**328**	**9**	**2.7**	**45**	**13.7**	**395**	**39**	**9.9**	**28**	**7.1**	**464**	**40**	**8.6**	**59**	**12.7**	**1736**	**102**	**5.9**	**192**	**11.1**

TABLE VI SHOWS THAT AFTER TWO YEARS IN THE FORMULA PHONICS READING CHAIN PROGRAM MENTONE AND ROOSEVELT SCHOOLS, WITH MUCH HIGHER PERCENTILE RANKINGS OF AID FOR DEPENDENT CHILDREN AND BILINGUAL STUDENTS THAN ARE FOUND IN THE FIRST-YEAR ATASCADERO SCHOOLS, HAD ONLY 4.2% SEVERELY RETARDED AND 10.1% MILDLY RETARDED READERS IN ALL GRADES. THIS COMPARES WITH 7.7% SEVERELY RETARDED AND 12.0% MILDLY RETARDED READERS IN THE FOUR ONE-YEAR SCHOOLS. THESE DATA SHOW THAT IF THE SEVEN SCHOOLS IN THIS STUDY FED THE SAME JUNIOR HIGH SCHOOL, ONLY 40 OF 464 (8.6%) ENTERING SEVENTH GRADERS WOULD NEED SPECIAL REMEDIAL READING PROGRAMS.

In addition to providing background material, such as Aid For Dependent Children (A.F.D.C.) percentile rankings for the schools in this study, the California Assessment Program (C.A.P.) data may also be used as an external measure of evaluation for certain of the schools. Three schools, Patterson Road, Mentone, and Roosevelt had been in Reading Chains long enough so that the C.A.P. testing in March and April, 1976, was meaningful. Such is not the case with the four Atascadero Schools, however, because many students in those schools were actually in Reading Chain Dialog Groups only two or three months before they were tested. Hence, the first meaningful C.A.P. data from those schools which will reflect the impact of their Formula Phonics Reading Chain Program will be released by the state in November, 1977. Table VII shows California Assessment Program data which was gathered in March (Grades 2, 3) and April (Grade 6) 1976, at Patterson Road, Mentone, and Rooseveit Schools.

Table VII

California Assessment Program Data for Three Reading Chain Schools

Background Factors	Median School in State	Patterson Road	Mentone	Roosevelt
State Percentile Rank				
Socio-Economic Index		77	24	47
Percent A.F.D.C.		16	60	69
Percent Bilingual		26	71	85
Percent Minority (District Survey)		5%	23%	46%
Reading—Grade Two				
Percent Correct Score	70.2%	84.2%	73.8%	–
State Percentile Rank		92	62	–
Reading—Grade Three				
Percent Correct Score	84.4%	92.6%	82.5%	85.9%
State Percentile Rank		92	42	57
Reading—Grade Six				
Percent Correct Score	67.5%	82.3%	73.5%	68.3%
State Percentile Rank		97	76	54
Written Expression—Grade Six				
Percent Correct Score	63.8%	75.9%	69.0%	64.6%
State Percentile Rank		94	74	54
Spelling—Grade Six				
Percent Correct Score	64.0%	73.7%	67.9%	62.4%
State Percentile Rank		94	75	40
Mathematics—Grade Six				
Percent Correct Score	57.3%	65.4%	60.9%	59.9%
State Percentile Rank		83	67	62

THESE SCORES ARE FOR *EVERY* STUDENT IN A GRADE EXCEPT FOR THOSE WHO ARE NON-ENGLISH SPEAKING.

THESE DATA FROM THE 1975-76 CALIFORNIA ASSESSMENT PROGRAM PROVIDE PERCENTILE RANKINGS FOR STUDENTS IN THE TARGET SCHOOLS AS COMPARED WITH ALL CALIFORNIA SCHOOL CHILDREN IN THE SAME GRADE. THE COMBINED SCORES FOR PATTERSON ROAD SCHOOL SHOW THAT ITS STUDENTS CONTINUE TO BE AMONG THE BEST EDUCATED AND HIGHEST ACHIEVING IN THE STATE.[4]

THE MENTONE SIXTH GRADE DATA IS REMARKABLE BECAUSE WHILE IT SHOWS PERCENTILE RANKINGS IN READING OF 76, IN WRITTEN EXPRESSION 74, AND IN SPELLING 75, THE BACKGROUND FACTORS SHOW A SOCIO-ECONOMIC INDEX OF 24, WHICH IS BELOW 76 PERCENT OF CALIFORNIA SCHOOLS. MENTONE ALSO HAS A 23% MINORITY POPULATION. THESE STATE ACHIEVEMENT SCORES SUGGEST THAT AT MENTONE SCHOOL THE FORMULA PHONICS READING CHAIN PROGRAM HAS TAKEN SIXTH GRADERS SOME WAY BEYOND THAT POINT WHICH REFLECTS "AN EQUAL EDUCATIONAL OUTCOME."

THE DESEGREGATION PROGRAM AT ROOSEVELT SCHOOL BRINGS TOGETHER TWO VERY DIFFERENT POPULATIONS. ABOUT HALF THE STUDENTS ARE MAJORITY ETHNIC, AFFLUENT, AND NATIVE SPEAKERS OF ENGLISH. THE REMAINDER ARE MAINLY SPANISH SURNAMED, POOR, AND OFTEN LINGUISTICALLY AND CULTURALLY DIFFERENT. 48% OF THE DISTRICT'S THIRD AND SIXTH GRADE NON-ENGLISH SPEAKING STUDENTS ATTEND THE SCHOOL. HOWEVER, ROOSEVELT'S SIXTH GRADERS' STATE PERCENTILE RANKING IN READING PLACES THEM FOURTH AMONG SANTA BARBARA'S 10 REGULAR ELEMENTARY SCHOOLS. THEY ARE SECOND IN WRITTEN EXPRESSION AND FIFTH IN SPELLING.

[4]On February 8, 1977, Principal Jerry Coker wrote to Patterson Road School parents concerning the C.A.P. achievement scores. That letter concludes with these words:

These scores reflect an interesting trend in terms of new student population. We have been receiving a number of students who need and are receiving help in reading. It would be interesting to know our standing in the state if such scores were not included. Student relocation is considered in state test results but movement to provide specific help to youngsters is not considered in computing percentile rankings. The combined state test results are among the best in the state and we can all be thankful to the Patterson Road faculty for their dedication, love and professionalism.

The final tables in this study focus on whether the data from the six new programs show that they have achieved the four factors which were identified in the 1974-75 study of the Formula Phonics Reading Chain Program at Patterson Road School. Current achievement scores from Patterson Road School are also shown so it can be seen whether the earlier scores in that program have been replicated.

Table VIII

Reading Comprehension Scores Should Be Higher Than Vocabulary Scores

School	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Patterson Road–1975	**N.A.**	**Yes +0.9**	**Yes +1.3**	**Yes +0.4**	**Yes +0.8**
Patterson Road–1976	N.A.	Yes +0.5	Yes +0.9	Yes +0.6	Yes +0.2
Mentone–1976	N.A.	N.A.	N.A.	N.A.	N.A.
Roosevelt–1976	N.A.	Yes +0.2	No –0.2	Yes +0.3	Yes +0.4
Lewis Avenue–1976	No –0.3	Yes +0.2	No –0.1	Yes +0.4	Yes +0.2
Monterey Road–1976	N.A.	Yes +1.0	Yes +0.8	Yes +0.9	Yes +0.6
Santa Margarita–1976	Yes +0.3	No 0.0	N.A.	N.A.	N.A.
Santa Rosa–1976	N.A.	N.A.	No 0.0	Yes +0.8	Yes +0.6
SUMMARY–SIX SCHOOLS	**YES 1**	**YES 3**	**YES 1**	**YES 4**	**YES 4**
	NO 1	**NO 1**	**NO 3**	**NO 0**	**NO 0**
	N.A. 4	**N.A. 2**	**N.A. 2**	**N.A. 2**	**N.A. 2**

IN 1976, EVERY CLASS AT PATTERSON ROAD SCHOOL SCORED HIGHER IN READING COMPREHENSION THAN IN READING VOCABULARY. IN THE REPLICATION SCHOOLS 13 CLASSES HAD HIGHER READING COMPREHENSION SCORES, TWO CLASSES HAD THE SAME SCORES, AND THREE CLASSES HAD HIGHER READING VOCABULARY SCORES. THIS FACTOR OBTAINED IN 66.7% (13 of 18) OF CLASSES IN THE REPLICATION SCHOOLS.

Table IX

Total Reading Scores Should Be Higher Than Grade Norms and Total Reading Scores in Grades Four, Five, and Six Should Be as High or Higher Above Grade Norms as Are Total Reading Scores in Grades Two and Three

School	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Patterson Road–1975	**Yes +0.6**	**Yes +1.5**	**Yes +1.5**	**Yes +1.7**	**Yes +2.0**
Patterson Road–1976	Yes +0.6	Yes +1.5	Yes +2.0	Yes +2.0	Yes +1.7
Mentone–1976	Yes +1.8	Yes +1.3	Yes +2.6	Yes +2.3	Yes +1.9
Roosevelt–1976	N.A.	Yes +0.5	Yes +0.3	Yes +0.5	Yes +0.5
Lewis Avenue–1976	Yes +0.3	Yes +0.9	Yes +0.3	Yes +0.5	Yes +0.5
Monterey Road–1976	N.A.	Yes +1.8	Yes +1.2	Yes +1.7	Yes +1.7
Santa Margarita–1976	Yes +1.0	Yes +0.5	No –0.1	Yes +1.0	Yes +0.5
Santa Rosa–1976	N.A.	N.A.	Yes +0.4	Yes +1.0	Yes +1.4
SUMMARY–SIX SCHOOLS	**YES 3**	**YES 5**	**YES 5**	**YES 6**	**YES 6**
	NO 0	**NO 0**	**NO 1**	**NO 0**	**NO 0**
	N.A. 3	**N.A. 1**			

IN 1976, EVERY CLASS AT PATTERSON ROAD SCHOOL SCORED HIGHER IN TOTAL READING THAN ITS GRADE NORM. IN THE REPLICATION SCHOOLS 25 CLASSES SCORED HIGHER THAN THEIR GRADE NORMS AND ONE CLASS SCORED LOWER. THIS FACTOR OBTAINED IN 96.2% (25 OF 26) OF THE CLASSES IN THE REPLICATIONS SCHOOLS. THE MEAN SCORE FOR THE 26 CLASSES IN THE REPLICATION SCHOOLS IS ONE YEAR ABOVE GRADE LEVEL.

Table IX can also be used to study the *third factor—Total Reading scores in grades four, five, and six should be as high or higher above grade norms as are Total Reading scores in grades two and three.* It is seen that three, second grade classes had mean Total Reading scores 10 months above grade norms; five, third grade classes averaged 19 months higher; six, fourth grade classes averaged 8 months higher; six, fifth grade classes averaged 12 months higher; and six, sixth grade classes averaged 11 months higher. In 1976, upper elementary children at Patterson Road School moved further above grade norms than had their fellows a year earlier. Primary grade children maintained the same position as did second and third graders in 1975. The data show that, generally, there is no falling off of reading achievement levels as students in Reading Chain programs pass through the grades.

Severe and mild reading retardation occurrences for *all* grades involved in the program are shown in Table X. Scores are shown from Patterson Road School after 27 and 37 months in the program, for Mentone and Roosevelt Schools after 18 months, and for the Atascadero schools after the first year.

Nothing in this study has greater budgetary and social implications for the educational community than the fact that reading retardation is being reduced significantly in the target schools. This is because students with reading disability—no matter what the causes—cost more to educate the longer they stay in school. Unfortunately, the cost for maintaining many of these impoverished readers after they leave school is even greater than when they were in attendance.

Table X
Severe Reading Retardation Should Fall Below 5%
And Mild Reading Retardation Should Fall Below 10%
After the Program's Second Year

School	Months in Program	Grades in Program	N =	Number Severely Retarded	Percent Severely Retarded	Number Mildly Retarded	Percent Mildly Retarded
Patterson Road–1975	**27**	**2–6**	**269**	**5**	**1.9%**	**19**	**7.1%**
Patterson Road–1976	37	2–6	247	7	2.8%	23	9.3%
Mentone–1976	18	2–6	268	4	1.5%	15	5.6%
Roosevelt–1976	18	3–6	283	19	6.7%	41	14.5%
Lewis Avenue–1976	8	2–6	347	34	9.8%	61	17.6%
Monterey Road–1976	11	3–6	223	10	4.5%	14	6.3%
Santa Margarita–1976	8	2–6	190	14	7.4%	27	14.2%
Santa Rosa–1976	8	4–6	178	14	7.9%	11	6.2%
TWO YEAR PROGRAMS			**551**	**23**	**4.2%**	**56**	**10.1%**
ONE YEAR PROGRAMS			**938**	**72**	**7.7%**	**113**	**12.0%**
SIX REPLICATION SCHOOLS			**1489**	**95**	**6.4%**	**169**	**11.3%**
SEVEN SCHOOLS			**1736**	**102**	**5.9%**	**192**	**11.1%**

IN 1976, PATTERSON ROAD SCHOOL HAD ABOUT THE SAME PERCENTAGE OF RETARDED READERS AS IN 1975. THIS OBTAINED EVEN THOUGH PRIMARY STUDENTS WERE POST TESTED TWO MONTHS EARLIER THAN IN 1975.

DATA FROM THE SIX REPLICATION SITES SEEMS TO INDICATE THE TOTAL TIME A STUDENT SPENDS IN A FORMULA PHONICS READING CHAIN PROGRAM WILL HAVE A GREATER IMPACT ON WHETHER HE WILL BECOME AN EFFECTIVE READER THAN WILL HIS ETHNICITY, SOCIAL CLASS, OR LINGUISTIC OR CULTURAL BACKGROUND. THIS FINDING IS IN DIRECT CONFLICT WITH A NUMBER OF EARLIER STUDIES WHICH HAVE REPORTED, FOR INSTANCE, "THE NORM FOR LOWER WORKING CLASS CHILDREN (THE POORER AND MORE CULTURALLY DEPRIVED PART OF THE WORKING CLASS) IS TO FALL BACK UNTIL THEY ARE A YEAR OR MORE BEHIND BY THE TIME THEY REACH FOURTH OR FIFTH GRADE."[5] DEUTSCH HAS WRITTEN, "THE NATURE OF THEIR DISADVANTAGE IS A PERSUASIVE ONE, STARTING EARLY IN CHILDHOOD. IT INVOLVES THE LACK OF NON-VERBAL AS WELL AS VERBAL ABILITIES AND TENDS TO INCREASE RATHER THAN DECREASE DURING THE ELEMENTARY SCHOOL YEARS."[6] OTHERS WHO HAVE

[5]Allen H. Barton, "Reading Research and Its Communication: The Columbia-Carnegie Project," in *Reading as an Intellectual Activity*, ed. J. Allen Figurel (International Reading Association Conference Proceedings VIII, 1963), pp. 246-50.

[6]Martin Deutsch, "The Role of Social Class in Language Development and Cognition," *American Journal of Orthopsychiatry*, XXXV (January, 1965), 78-88.

REPORTED A HIGH CORRELATION BETWEEN SOCIO-ECONOMIC LEVELS AND ACHIEVEMENT ARE EDWIN HILL AND MICHAEL GIAMMATTEO.[7] SPACHE POINTS OUT, "SOCIOLOGISTS HAVE LONG NOTED THE RELATIONSHIPS BETWEEN ACADEMIC SUCCESS AND SUCH FACTORS AS PARENTAL ATTITUDES, INCOME, AND OCCUPATIONAL LEVEL; DEVIANT CULTURAL OR LANGUAGE PATTERNS, AND RACIAL, ETHNIC, AND SOCIAL-CLASS GROUP PATTERNS OF BEHAVIOR AND THOUGHT WHICH CONFLICT WITH COMMON MIDDLE-CLASS-ORIENTED EDUCATIONAL GOALS."[8] SUCH WAS NOT THE CASE AT MENTONE AND ROOSEVELT SCHOOLS.

A study of Tables VIII, IX, and X provides convincing evidence that the six replication schools are producing the same patterns of student achievement as are found in the model school.

In the six replication programs:

- 66.7% of the classes scored higher in Reading Comprehension than in Vocabulary.
- 96.2% of the classes had Total Reading scores higher than their grade norms.
- Generally, upper elementary classes scored higher above grade norms than did primary classes.

In the three programs of two or more years' duration, Mentone, Patterson Road, and Roosevelt Schools, of 531 upper elementary students:

- Only 12 (4.0%) scored in Total Reading two years or more below grade norms.
- Only 55 (10.4%) scored between one year and 19 months below grade norms.

In every case, students at Patterson Road School in 1976 replicated the achievement scores registered in 1975.

Summary

This study was undertaken to determine if it is possible to use certain commercially produced materials to replicate Formula Phonics Reading Chain Programs in a number of different California public schools serving a broad spectrum of student populations. On-site visits were first undertaken to locate Reading Chain schools whose program design, staff development procedures, use of Formula Phonics materials, and reading-language processing teaching techniques paralleled those found in the nationally honored program at Patterson Road School in Orcutt, California.

The Patterson Road School program had been studied in 1975 and that report contains a body of extraordinary student achievement data. These scores are so different from the student achievement profiles which are generally reported in the literature as to suggest that this type of achievement might be endemic to Reading Chain programs. Hence, if the same achievement profiles were found in the six schools whose programs were examined, it could be claimed that program replication had taken place.

Four factors relating to student achievement were isolated from the data in the 1975 study of the Reading Chain program at Patterson Road School. These were:

1. Reading Comprehension scores are higher than Reading Vocabulary scores at every grade level.
2. Total Reading scores are higher than grade norms at every class level.
3. Total Reading scores in upper elementary classes (4, 5, 6) are as far above grade norms as are Total Reading scores for primary (2, 3) students.
4. After the program's second year severe reading retardation is found in less than 5% of the upper elementary students and mild reading retardation in less than 10% of these students.

Two of the six target schools had completed two years in the program when they were studied in 1976. The remaining four schools had been in the program some part of one school year. State percentile ranks from the California Assessment Program show that the schools range in "Socio-Economic Index" from 24 to 83; in "Percent of Aid for Dependent Children" from 34 to 69; in "Percent Bilingual" from

[7]Edwin H. Hill and Michael C. Giammatteo, "Socio-economic Status and Its Relationship to School Achievement in the Elementary School," *Elementary English*, XL (March, 1963), 265-70.

[8]George Spache, "Contributions of Allied Fields to the Teaching of Reading," *Innovation and Change in Reading Instruction*, ed. H. Robinson (The Sixty-seventh Yearbook of the National Society for the Study of Education, 1968), p. 241.

1 to 85; and in "Pupil Mobility" from 17 to 99. Percentage of minority students (primarily Spanish surnamed) ranges from 6.3 to 46.0. One of the schools, Roosevelt in Santa Barbara, is artificially desegregated by means of pairing and busing.

Student achievement in the seven schools was measured by one or more of these standardized tests: the *California Achievement Test,* the *Comprehensive Test of Basic Skills,* the *Metropolitan Achievement Test,* and the *Slosson Reading Test.* The cumulative effect of the program on student achievement is also documented by the fact that the evidence of replication is more pronounced in the two schools which have been involved longest in the program.

This is a remarkable achievement when it is seen that one of these schools, desegregated Roosevelt Elementary School, has a percentile ranking of bilingual students which is higher than 85% of the schools in California and a percentile ranking of A.F.D.C. students which exceeds that of 69% of the schools. The second school, Mentone Elementary School, has a percentile ranking of bilingual students which exceeds 71% and a percentile ranking of A.F.D.C. students which exceeds 60% of the schools in the state. Mentone has 23% and Roosevelt 46% minority students.

The 1,736 girls and boys in this study represent 31 grade level classes from the six replication sites and Patterson Road School. Every one of them participated in the exact same reading program. Every one of them has been taught the exact same system for decoding, understanding, discussing, spelling, writing about, and otherwise processing the printed word. Any student from one of the schools can be moved with confidence to the correct Reading Chain Dialog Group and grade level class in any one of the other schools. Any teacher can teach as successfully in one of the other schools as in his home school. This is so because the video programs and Formula Phonics printed materials have funded all teachers and students with the *same* basic information. The secret is standardization, not individualization—a "teacher centered" learning program rather than a "teacher proof" management program![9]

Why have staffs in the Formula Phonics Reading Chain Schools been so successful in increasing student achievement? In the conclusion of *The Acquisition of Knowledge in the Classroom* Berliner and Rosenshine write:

> "Major factors in the process of knowledge acquisition in the classroom are the content and emphasis of the curriculum in use and the content coverage and emphasis given through the teaching methods employed. The classroom behavior of a successful teacher is characterized by direct instruction, whereby students are brought into contact with the curriculum materials and kept in contact with those materials until the requisite knowledge is acquired. At the primary grades, direct instruction includes goal setting; allocation of sufficient time to reach goals; motivating students by appropriate choice of curriculum materials, teaching methods; and teaching behaviors so that active learning time is high; providing an academic focus; and monitoring student activities during the allocated instructional time. The successful teacher asks direct questions and provides positive and negative feedback to students on academic matters. The atmosphere for successful direct instruction is warm, and student behavioral problems are low in frequency.[10]

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[9]To examine the effectiveness which Formula Phonics Reading Chain Programs have on student populations of children who are poor and schooled in ethnic, cultural, and linguistic isolation, see: *The Formula Phonics Reading Chain Program at Bent-Mescalero Elementary School, Mescalero Apache Reservation—Tularosa, New Mexico Public Schools, School Year 1975-1976* and *The Formula Phonics Reading Chain Program at Mandaree Elementary School, Fort Berthold Indian Reservation—Mandaree School District Number 36, North Dakota, School Year 1975-1976.*

To examine the effectiveness of the Formula Phonics reading language processing *system* on a secondary school population which is generally poor as well as being culturally and linguistically different (Spanish surnamed), see: *The Formula Phonics Reading Program at Mountain View High School, El Monte, California, School Year 1975-1976.*

Copies of these studies are found in the Appendix.

[10]Berliner, David C. and Rosenshine, Barak. *The Acquisition of Knowledge in the Classroom.* (Beginning Teacher Evaluation Study, Technical Report IV-1). The Far West Laboratory for Educational Research and Development. San Francisco, 1976. p. 27.

This writing might be considered in terms of the description of the program at Patterson Road School.[11] Yet for all this, there are program outcomes which are even more important than are the student scores on standardized achievement tests.

Recently, Principal Jerry Coker, of Patterson Road School, spoke about his school's Formula Phonics Reading Chain Program at a meeting of the California Reading Association. He said then:

> "We know that standardized test scores show that our youngsters are among the highest achieving students in America. We also know for a fact that those tests are measuring only about 10% of all that our girls and boys are learning in their Reading Chain Dialog Groups and in their regular classrooms."

[11] "The Formula Phonics Reading Chain Program at Patterson Road School." *op.cit.* pp. 9-10.

Appendix

"Patterson Road School's Formula Phonics Reading Chain," by Jerry Coker, Principal, Patterson Road School, from *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* pp. 9-10. Integrative Learning Systems, Inc., Glendale, CA. 1975. Available through ERIC Document Reproduction Services, ED 112 367.

The Formula Phonics Reading Chain Program at Patterson Road Elementary School—School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1976.

The Formula Phonics Reading Chain Program in the Elementary Schools of the Atascadero, California Unified School District—School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1976.

The Formula Phonics Reading Chain Program at Mentone Elementary School, Redlands, California Unified School District—School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1977.

The Formula Phonics Reading Chain Program at Roosevelt Elementary School, Santa Barbara, California —School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1976.

The Formula Phonics Reading Chain Program at Bent-Mescalero Elementary School, Mescalero Apache Reservation, Tularosa, New Mexico Public Schools—School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1976.

The Formula Phonics Reading Chain Program at Mandaree Elementary School, Fort Berthold Indian Reservation—Mandaree School District Number 36, North Dakota, School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1977.

The Formula Phonics Reading Program at Mountain View High School, El Monte, California, School Year 1975-1976. Integrative Learning Systems, Inc., Glendale, CA. 1976.

THE STUDIES ARE AVAILABLE BY CONTACTING INTEGRATIVE LEARNING SYSTEMS, INC. / 326 WEST CHEVY CHASE DRIVE, NO. 11 / GLENDALE, CA 91204 / PHONE (213) 243-2675.

Patterson Road School's Formula Phonics Reading Chain[1]

By Jerry Coker, Principal

Dialog Group
Patterson Road School

IN DECEMBER, 1972, PATTERSON Road Elementary School in the Orcutt Union School District, Orcutt, Santa Barbara County, California, became the first school in America to be restructured to accommodate a Formula Phonics Videotape Reading Chain. This was a major undertaking because it involved the restructuring of our school day; the training of staff, myself included, to use a reading-language processing system which was totally different from the basal reading system used previously; the introduction of the new system to *all* of our second through sixth graders; and the introduction of the program to our parents and expanded community. We can say with certainty that the effort was worth it; for now our students are among the best reading—and best *read*—boys and girls in America. Our school is one of the most visited sites in California. And our Formula Phonics Reading Chain has been cited, after a search which studied some 1500 reading programs nation-wide, as constituting one of the most effective reading programs in the land. This paper is written so we may share information about our reading program with other educators.

COMMUNITY: Orcutt is a semi-rural suburb of Santa Maria, California, a city close to the space complex at Vandenberg Air Force Base. Our students are generally majority ethnic (3% minority) and come from upper-lower and lower-middle income homes. The transiency rate at Patterson Road School is very high. We are paired with another school which sends us its educationally handicapped and learning disability group boys and girls during the course of the school year as they are identified. As our program has matured, our parents have become ever more supportive of our efforts.

OUR PROGRAM—STAFF DEVELOPMENT: The specific system which is used in the decoding, questioning, and spelling elements of our program is called Formula Phonics. The reliability and ease of instruction of these elements have made it possible for us to devote the major portion of our instructional time treating with the higher level learning and thinking processes. We call *everything* a teacher teaches a pupil to do with the printed word "language processing." In every Dialog Group this processing of language goes forward in the affective and cognitive domains by way of reading, spelling, writing, listening and speaking. It also goes forward in the several content areas and in the practical and fine arts areas as well.

As the first step in the program, all of our certificated staff were trained in the specific Formula Phonics methodology by reading two teaching manuals, *Formula Phonics*, which treats with decoding and oral language processing, and the *Formula Phonics Spelling Book*, which treats with spelling and written language processing. We then continued our training by watching together and then discussing the video tapes which make up *The Formula Phonics Videotape Reading Program*. We studied those video programs very carefully because we knew that later we were to show ten of them to all of our second through sixth graders. (Today in addition to the twelve video programs which we used in our training there are five new programs which contain segments which were videotaped on-site at Patterson Road School and which are used as a part of our ongoing staff development.) In a series of after school sessions spread over two or three weeks, we finished this element of our training and were ready to set up our Reading Chain.

OUR PROGRAM — READING CHAIN DESIGN: The first step in setting up our Reading Chain consisted of using the ten video programs to fund *every one* of our second through sixth graders with the same body of phonetic decoding and spelling information. Each of these tapes is about 24 minutes long and we found that, as a general rule, students in grades three to six are able to handle one tape per day. This is because students process the information in the video programs even as they watch by working along in their programming book, *The Formula Phonics Reading Book*, and doing the suggested follow-up activities afterwards.

Because second graders and special education youngsters usually required a longer period of time to watch the video programs, they started watching them some time before the others. Students only watch the ten video programs once in their school lives. After the first year only second graders and new enrollees need watch them each September. Of course, each new student who enrolls in our school anytime after September watches the ten programs before being assigned to a Dialog Group.

While our students were watching the video programs in their homerooms, we were busy setting up our Reading Chains. We instituted a staggered day schedule with half our pupils arriving 45 minutes early in the morning and the others remaining 45 minutes later in the afternoon so that our teachers enjoy the luxury of teaching two small Reading Chain groups each day. Each student was assigned to a homogeneous, ungraded group according to consideration of vocabulary and comprehension scores on the C.T.B.S. and our teachers' personal assessments of *total* reading capacity, store of information based on previous reading, and maturity level.

Each of the reading sections is called a Dialog Group and our Reading Chain is made up of a number of groups. In our Chain every child, including second graders, can be assigned to the top group if that is where the faculty believes he would profit the most. However, in placing students in the Reading Chain, great care is taken to see to it that older boys and girls are not placed in groups dominated by those who are younger. Additionally, every five or six weeks every student is evaluated by the staff and those who are ready are placed in higher groups in the Chain.

Just before our Reading Chain was

[1] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, California. 1975. Available through ERIC Document Reproduction Service, ED 112-367.

to go into operation, our teachers drew numbers to determine which group they were to teach in our morning Chain and which group in our afternoon Chain. Thus, in the morning a sixth grade teacher might find herself working with second and third graders, while a second grade teacher might draw a group of gifted fourth, fifth, and sixth graders. Each might find herself with an entirely different group of youngsters in the afternoon. Obviously, we knew that we must learn to treat with every type of reading and language instructional need and procedure which one might find in any school.

This is particularly true when one learns that every five or six weeks the teacher-dialogists rotate groups. On those occasions, every teacher moves down to the next lower group and the teacher with the lowest reading ability group moves up to teach the group at the top of the Chain. Having teachers rotate groups provides that every student will, over a period of one or two years, be exposed to the special teaching skills and literary expertise of every teacher.

Our reading specialist maintains individual and group records for all students in the Reading Chain. Titles of books and other reading sources used in Dialog Groups are recorded along with group reading scores on a cumulative basis. In addition to serving as a resource specialist to staff regarding discussion techniques and language arts activities, she relieves classroom teachers during reading time. We call this "walking through the Chain" and find it to be a most valuable tool for professional growth.

The final organizational technique involves staff discussion sessions. These are especially important during the first two years of the program and even after that time we find they serve a useful purpose. These feedback sessions must be honest, open, and provide positive input for constant program improvement.

OUR READING CHAIN–TEACHING STRATEGIES. Virtually every minute in each 45 minute dialog period is given over to the reading, discussion (dialog), and other processing of worthy literature. Until a child progresses to one of our many top groups where the students are reading and processing such works as *Flowers for Algernon*, *The Hobbit*, *Fantastic Voyage*, or *Animal Farm*, his group will always be reading material which is about two years *above* his tested reading level and never *below* his true grade level. This is possible because all of the students in a group have been exposed to the same body of phonetic information and because the teacher works with the group as though it were an individual.

In the Dialog Groups one student and then another is called on to read aloud. Everyone understands that the oral reader is serving as a model to the whole group. The model reads as much or as little as his teacher desires; and at any point during, or immediately after, the teacher questions the entire group concerning any word, sentence, paragraph, or idea the reading material contains. If a model encounters a word he does not know, the teacher writes it on a hand held chalkboard and then leads the group in attacking the word. Final closure on the word, however, is reserved for the model.

To aid in systematizing these very important word attack episodes, each classroom contains a set of four Formula Phonics poster-wall charts. Two of these charts carry basic phonetic information; a third contains the Formula; and the fourth which is called the "Dialog Chart" gives the group a structure for discussion and for writing after decoding episodes. The Formula functions as a systematic retrieval system which students use to retrieve and then apply the phonetic information they received from the ten video programs and have had consistently reinforced in the Dialog Groups and in their homerooms.

At Patterson Road our students attack words only in the natural context of reading for information and pleasure. They develop decoding skills as an outcome of the group process. We observed that during each month in our program students internalized more and more of the decoding system. Because of this our teachers spent less and less time helping groups attack words and more and more time in building vocabulary or in discussing plot, characterization, inference, or ideas.

Another way in which we help our boys and girls learn decoding skills is by way of spelling. The system's spelling program does away with the need for most drill on phonetic skills and at the same time opens up the world of writing for our students. The spelling formula and the decoding formula help our students *utilize* the same body of phonetic information and skills. Just as soon as our youngsters begin to synthesize the spelling system we begin teaching them to process what they read by way of writing. This is another reason why we always have our students read the best written literature possible. We want what they read to serve as a model for what they write.

Because we elected not to use controlled vocabulary material, high interest-low vocabulary stories, or *simplified* abridgements when teaching our youngsters to read, finding reading material did present a problem. During the first year almost all reading in the Dialog Groups was in short stories. We borrowed anthologies from the secondary schools for our more able groups and used upper-elementary material for our younger and less able readers.

After the first year, most of our teachers turned to paperback editions of quality selections for use with the Dialog Groups. Our reading specialist maintains a library of these titles which we buy in sets of 23 copies per title. This number was chosen because while our groups average 15 students each, occasionally the top groups swell to 20 students. Our yearly cost for these titles for all groups in the Chain has averaged about $250.00 and we now have a collection of more than 100 titles.

Because Formula Phonics takes care of the mechanics of decoding and spelling and so permits our students to work in serious literature, most of our staff development work during the second and third years has been in the areas of higher language processing and questioning. We believe that while it is important to teach students how to attack words, to spell, and to develop their vocabularies, it is far more important to teach them how to process whatever it is they read.

In our staff development-feedback sessions we have read and discussed such authors as Bloom and Taba. We have used materials developed at the Nebraska Curriculum Development Center at the University of Nebraska and at California's Structure of the Intellect Center. Additionally, staff at Integrative Learning Systems of Glendale, California, who designed our Reading Chain and produces all Formula Phonics materials, has been most helpful in teaching us to handle the three areas of inquiry—basic, maieutic, and Socratic—which we employ in our Dialog Groups and classrooms.

I say "classrooms" because our Formula Phonics Reading Chain Program has had its greatest impact on the day-to-day teaching in the homerooms. We have moved to a point at Patterson Road School where virtually all students read and process content area curriculum in materials written at or above their true grade level. In fact, during the past (1974-1975) school year much of the content area reading in our third through sixth grade classrooms has been in Scholastic Units which we ordered from the California State Supplementary Secondary Book Lists, rather than the elementary lists.

CONCLUSION: Our Formula Phonics Reading Chain at Patterson Road Elementary School has "turned our school around" because it is a program for *every* one of our students and *every* one of our teachers. While the hard data is overwhelming—our third graders in spring, 1974, scoring at the 94%ile—the effect of the program on the total educational process is really more important. Our classrooms are quiet and orderly and happy. Our teachers are teaching and our girls and boys are learning. Our message? "When all of the resources of all of the members of highly trained and motivated faculty are focused on a group of boys and girls, there appears to be no limit as to how far those youngsters may be taught." □

The Formula Phonics Reading Chain Program at Patterson Road Elementary School

School Year—1975-1976

The Program

The most copied, visited, studied, and honored Formula Phonics Reading Chain Program is located at Patterson Road Elementary School in Orcutt, California. At semester's close in June, 1976, the program had been in operation for 37 school months. Because the Formula Phonics Reading Chain Program at Patterson Road School is cited in the U.S. Office of Education, National Right to Read's study to identify America's most successful reading programs, it has been the subject of a number of dissemination projects.

The program is examined in detail in the 48-page dissemination/replication study, *The Formula Phonics Reading Chain Program at Patterson Road Elementary School.* It is also the subject of a 55-minute, color television production, *A Video Trip to Patterson Road School.* The study is available in hard cover or microfiche through the ERIC Document Reproduction Service (ED 112 367). It can also be found at the more than 500 ERIC Microfiche Collection Depositories both in the United States and throughout the world. Each of these ERIC Depositories is being afforded the opportunity to acquire a copy of the video production so that those who read the study can also "visit" the school by way of television. Many are taking advantage of this offer.

Since September, 1974, Patterson Road School has served as an observation and training site for hundreds of educators who are establishing or teaching in Formula Phonics Reading Chain Programs. Today, staff development video programs whose teaching sequences were videotaped on-site at the school are used to train faculties in the Formula Phonics reading, spelling, discussion, and other language processing procedures.

Neither teachers nor students seem to be bothered by the steady stream of visitors who walk through their Dialog Groups and classrooms. However, there is some evidence to suggest that the school's extraordinarily high transiency rate may limit the scope of student achievement in a few instances. Because of its proximity to Vandenberg Air Force Base and because it receives, as they are identified during the school year, Educationally Handicapped students from certain other district schools, transiency has always been high.

During the past two years, however, another element has exacerbated this condition. Many parents of upper elementary grade children from both district and private schools are transferring their girls and boys into Patterson Road School. So great is the pressure that in September, 1974, so many new fifth graders enrolled that a third fifth grade class had to be established. In the 1975-1976 school year that class—now sixth graders—was further impacted by 20 new students. Additionally, there were seven Educationally Handicapped girls and boys in the three sixth grade classrooms. While new students cause no problems when they are placed in the Formula Phonics Reading Chain Dialog Groups, they can present difficulties in the classrooms where the content area reading and language processing take place, in many instances, at higher levels than these students were accustomed to in their former schools.

Learner Verification

The present study treats with the two questions most frequently asked about the program at Patterson Road School:

1. *Is it still possible, after three and one-half years, for staff at Patterson Road School to teach at such a high level that students continue to score far above national norms on standardized reading tests? Or has the "Hawthorne Effect" (or some other factor) lowered their effectiveness so that student scores are beginning to move back toward the mean for other United States elementary schools?*

2. *Is the program "elitist" so that exceptionally high reading scores by a minority of high achieving girls and boys masks average or below average reading scores for a majority of the students?*

Gathering data to illuminate these questions was made somewhat more difficult than in other years because of a district-level decision to institute annual testing in the schools to replace the usual spring and fall testing. Further, testing was moved to March (from May) so that grade norms moved two months out of phase. The levels of some of the tests were also changed. In order to have comparable data for at least the upper elementary students, fourth through sixth graders were tested with the correct level of Form S of the *Comprehensive Test of Basic Skills (C.T.B.S.)* at the end of May, 1976. No make-up tests were given and the tests were hand scored at the school.

By this means it was possible to identify a target population of fourth through sixth graders who were pre tested (and the test forms machine scored) in May, 1975, and post tested in May, 1976. Because there was no pre test for second graders, scores for *all* second graders who were tested in March, 1976, are included in this study. Because there was no way to identify which third graders had both pre and post test scores, scores for *all* third graders who were tested in March, 1976, are included in this study.

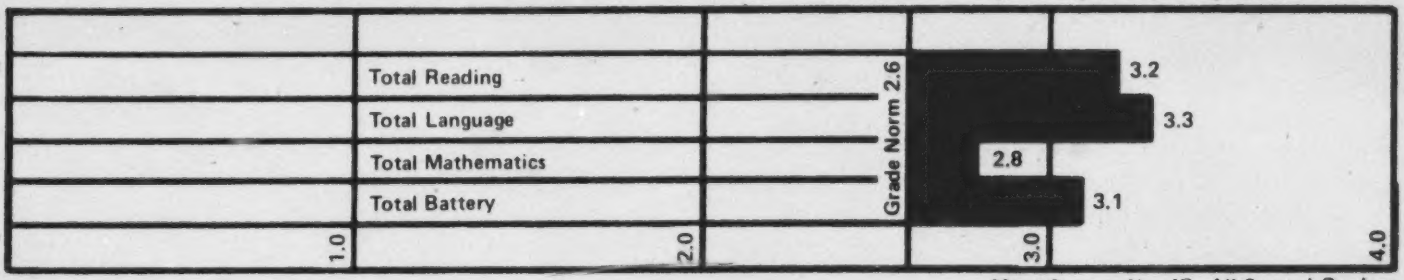
SECOND GRADE STUDY

Because they were not pre tested, there is no way to determine growth for the school's second graders. The solid bars in Table I show mean achievement beyond the March, 1976, grade norm of 2.6 for *all* of the school's second graders.

Table I

Grade Two—Total C.T.B.S. Battery

C.T.B.S. Level C, Form S, March, 1976, Grade Norm 2.6



Mean Scores—N = 47—All Second Graders

Because both classes were tested with Level C of the C.T.B.S., it is possible to compare scores for the second grade classes of 1975 and 1976. However, it must be noted that two entirely different groups of students are being compared and that the May, 1975, grade norms were 2.8 and those in March, 1976, were 2.6. Further, in the 1975 sample only students who had been in the program for eight months were reported. In the 1976 class, every second grader is included. Table II compares adjusted scores for the two second grade classes.

Table II

Second Grade Classes Compared

Test	May, 1975 (N = 40)	March, 1976 (N = 47)	+2 Months	Difference
Total Reading	3.4	3.2	3.4	.0
Total Language	3.5	3.3	3.5	.0
Total Mathematics	3.1	2.8	3.0	−.1
Total Battery	3.2	3.1	3.3	+.1

TABLE II SHOWS NO APPRECIABLE DIFFERENCE BETWEEN SCORES FOR THE TWO CLASSES WHEN THEY ARE CORRECTED FOR TIME. IN THE FOUR TEST PERIODS *BEFORE* THE PROGRAM BEGAN (1969–1973), THE AVERAGE SECOND GRADER SCORED 2.9 ON TOTAL READING WHEN TESTED EACH MAY.

Table III shows the distribution of Total Reading scores for *every* second grader at Patterson Road School who was tested in March, 1976.

Table III
Grade Two

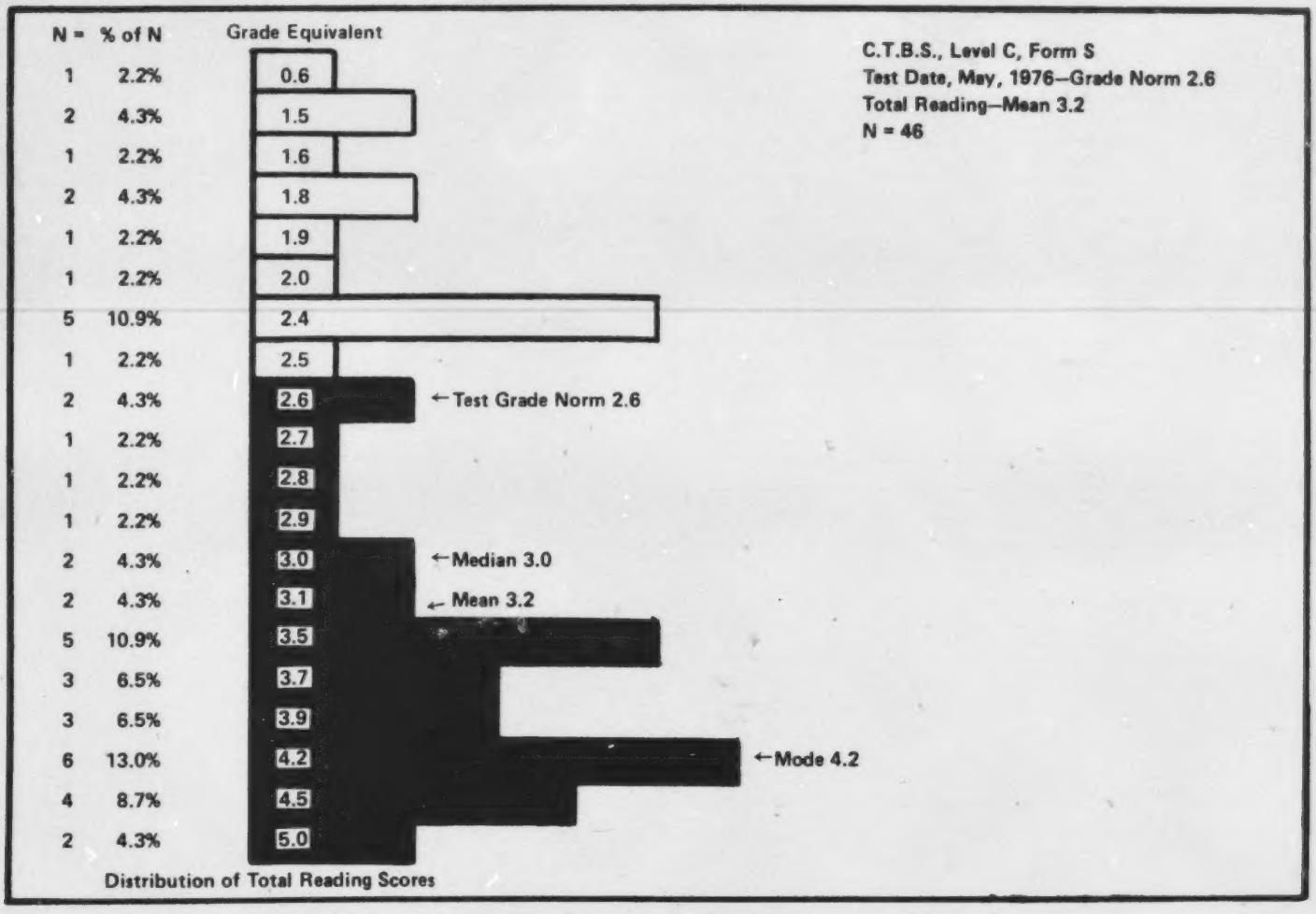


TABLE III SHOWS SCORES FOR 46 SECOND GRADERS (NORM 2.6) DISTRIBUTED AS FOLLOWS:

69.6% (32 of 46) SCORED *ABOVE* THE 2.6 GRADE NORM IN TOTAL READING
39.1% (18 OF 46) SCORED 3.6 OR HIGHER
4.3% (2 OF 46) SCORED 4.6 OR HIGHER
30.4% (14 OF 46) SCORED *BELOW* THE 2.6 GRADE NORM IN TOTAL READING
8.7% (4 OF 46) SCORED 1.6 OR LOWER

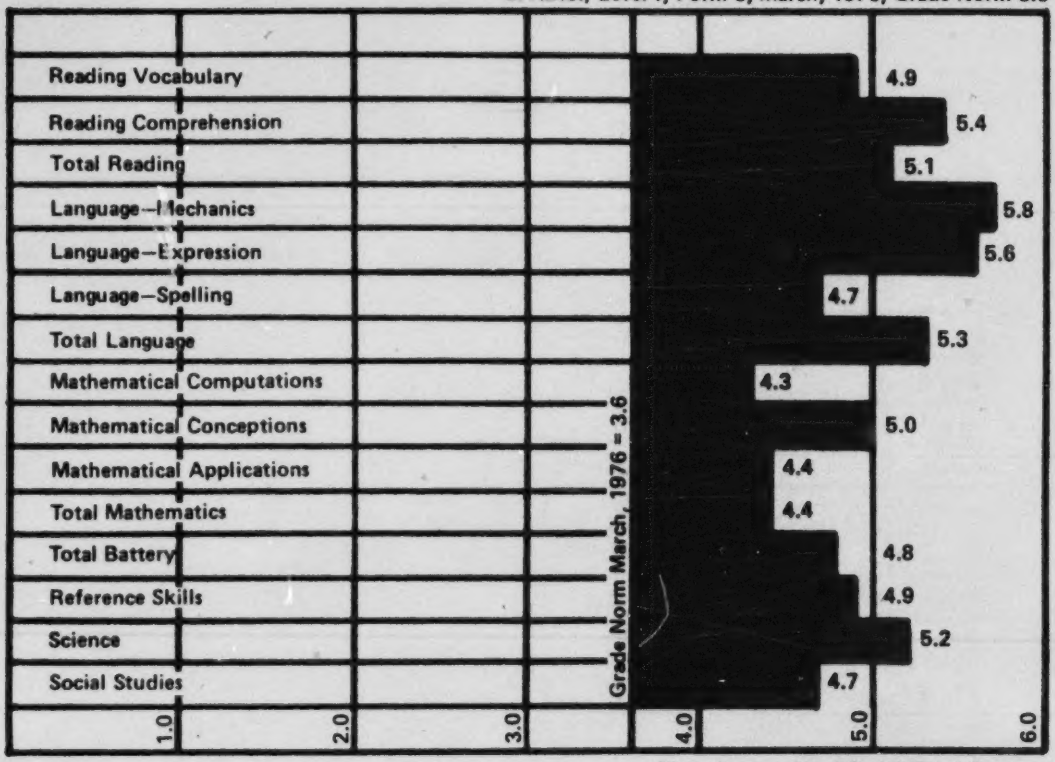
THIRD GRADE STUDY

The solid bars in Table IV show mean achievement beyond the March, 1976, grade norm of 3.6 for all of the school's third graders.

Table IV

Grade Three—Total C.T.B.S. Battery

C.T.B.S., Level I, Form S, March, 1976, Grade Norm 3.6



Mean Scores—N = 59, All Third Graders

TABLE IV SHOWS AVERAGE ACHIEVEMENT ABOVE THE GRADE NORM OF 3.6 FOR ALL THIRD GRADERS AT PATTERSON ROAD SCHOOL. NOTICE THE EXCEPTIONALLY HIGH SCORES IN THOSE SUB TESTS WHICH DEAL WITH READING, WRITING, AND OTHER FORMS OF LANGUAGE PROCESSING. THIS TYPE OF PROFILE IS GENERALLY FOUND IN MATURE FORMULA PHONICS READING CHAIN PROGRAMS AS READING AND LANGUAGE PROCESSING MOVES FROM THE READING CHAIN DIALOG GROUPS INTO THE CONTENT AREA TEACHING IN THE CLASSROOMS.

Table V compares adjusted scores for the 1976 third graders with the target third graders of 1975. As with the second graders, each population is composed of different students and the 1976 test occurred two months earlier than the test date in 1975 and include *every* third grader who was tested.

Table V

Third Grade Classes Compared

Test	May, 1975 (N = 49)	March, 1976 (N = 59)	+2 Months	Difference
Total Reading	5.3	5.1	5.3	0.0
Total Language	4.8	5.3	5.5	+0.7
Total Mathematics	4.6	4.4	4.6	0.0
Reference Skills	4.7	4.9	5.1	+0.4
Science	4.8	5.2	5.4	+0.6
Social Studies	4.9	4.7	4.9	0.0

C.T.B.S. Level I, Form S, Adjusted Grade Norm 3.8

TABLE V SHOWS THE SAME LEVEL OF ACHIEVEMENT IN TOTAL READING, TOTAL MATHEMATICS, AND SOCIAL STUDIES FOR THE TWO CLASSES WHEN CORRECTED FOR TIME. IT SHOWS SIGNIFICANTLY HIGHER SCORES IN TOTAL LANGUAGE, REFERENCE SKILLS, AND SCIENCE. IN THE FOUR TEST PERIODS *BEFORE* THE PROGRAM BEGAN (1969–1973), THE AVERAGE THIRD GRADER SCORED 3.7 ON TOTAL READING WHEN TESTED EACH MAY.

Table VI shows the distribution of *Reading Comprehension* scores for every third grader who was tested in March, 1976.

Table VI
Grade Three

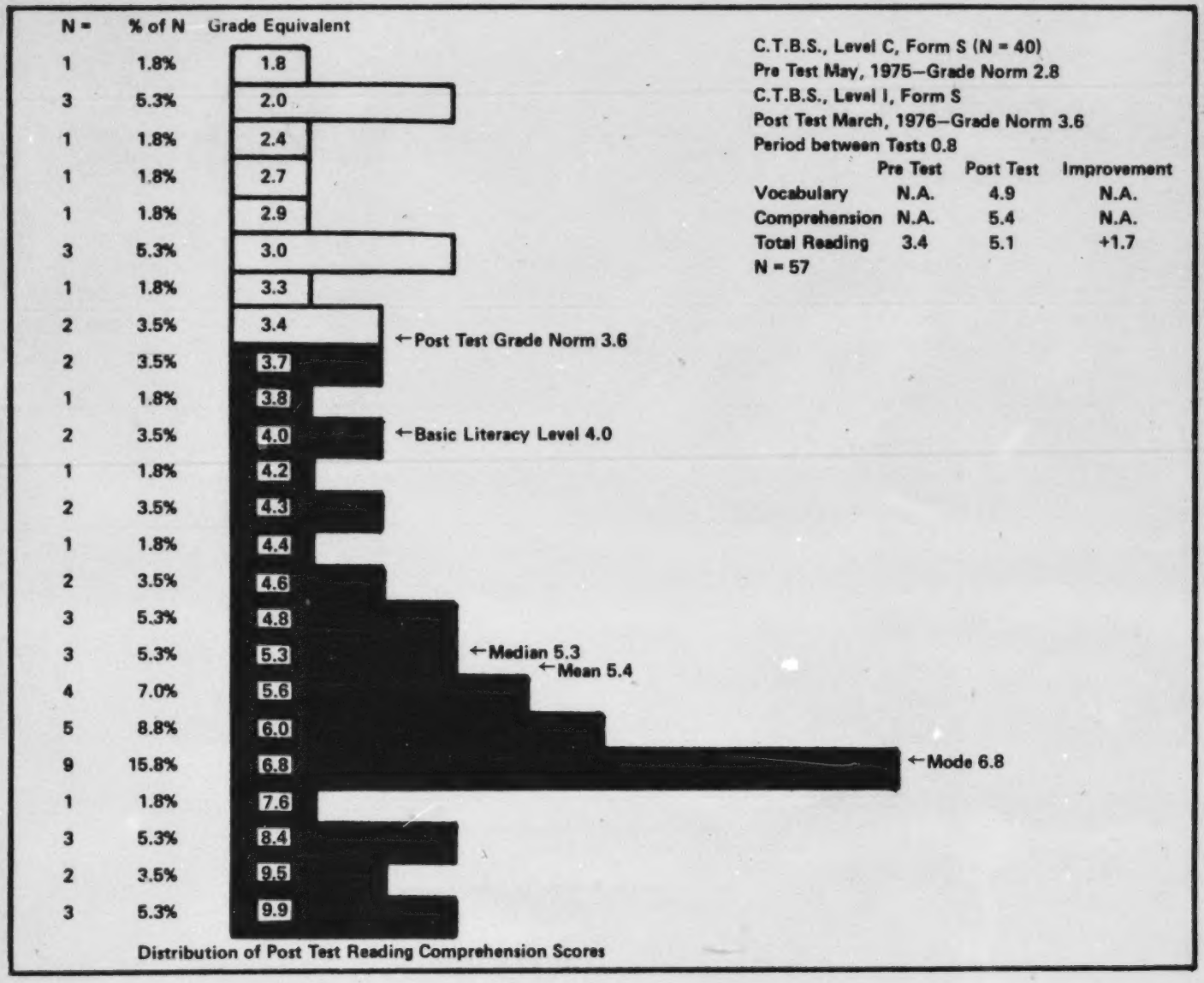


TABLE VI SHOWS SCORES FOR 57 THIRD GRADERS (NORM 3.6) DISTRIBUTED AS FOLLOWS:

77.2% (44 OF 57) SCORED *ABOVE* THE 3.6 GRADE NORM IN READING COMPREHENSION
61.4% (35 OF 57) SCORED 4.6 OR HIGHER
40.4% (23 OF 57) SCORED 5.6 OR HIGHER
31.6% (18 OF 57) SCORED 6.6 OR HIGHER
15.8% (9 OF 57) SCORED 7.6 OR HIGHER
5.3% (3 OF 57) HAD PERFECT 9.9 SCORES
22.8% (13 OF 57) SCORED *BELOW* THE 3.6 GRADE NORM IN READING COMPREHENSION
8.8% (5 OF 57) SCORED 2.6 OR LOWER

FOURTH GRADE STUDY

Table VII compares *C.T.B.S.* reading scores for target fourth graders tested in May, 1975 and May, 1976. Because both groups were tested in May, the grade norm of 4.8 is not adjusted as was necessary with the March test scores for students in grades two and three.

Table VII – Fourth Grade Classes Compared

Test	May, 1975 (N = 53)	May, 1976 (N = 40)	Difference
Vocabulary	5.7	6.3	+0.6
Comprehension	7.0	7.2	+0.2
Total Reading	6.3	6.8	+0.5

C.T.B.S. Level I, Form S, Grade Norm 4.8

TABLE VII SHOWS THAT IN EACH AREA OF READING THE 1976 FOURTH GRADERS SCORED HIGHER THAN DID FOURTH GRADERS A YEAR EARLIER. NOTE THAT THE AVERAGE FOURTH GRADER AT PATTERSON ROAD SCHOOL HAS A TOTAL READING SCORE TWO YEARS ABOVE THE 4.8 GRADE NORM AND A READING COMPREHENSION SCORE TWO YEARS AND FOUR MONTHS HIGHER.

Table VIII shows the distribution of *Reading Comprehension* scores for target fourth graders as well as showing the mean pre and post test reading scores for those same 40 students. In addition to the 40 target fourth graders there are May, 1976, test scores for 12 *new* fourth graders who had entered the school after May, 1975. Mean reading scores for these 12 students were: Vocabulary 4.7; Comprehension 5.6; and Total Reading 5.2. When these scores are included with those of the target group, mean reading scores for the school's 52 fourth graders are: Vocabulary 5.9; Comprehension 6.8; and Total Reading 6.4.

Table VIII – Grade Four

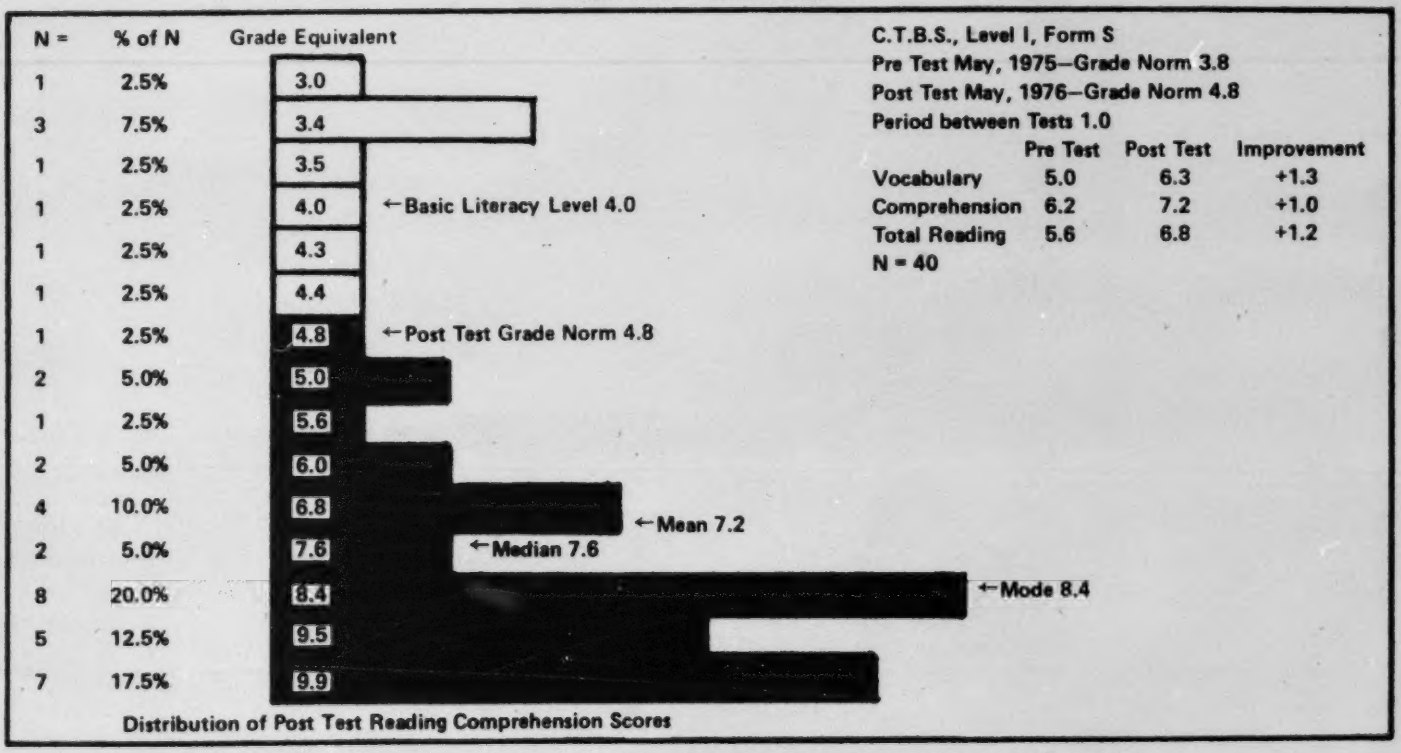


TABLE VIII SHOWS SCORES FOR 40 FOURTH GRADERS (NORM 4.8) DISTRIBUTED AS FOLLOWS:

80% (32 OF 40) SCORED *ABOVE* THE 4.8 GRADE NORM IN READING COMPREHENSION
70% (28 of 40) SCORED 5.8 OR HIGHER
65% (26 OF 40) SCORED 6.8 OR HIGHER
50% (20 OF 40) SCORED 7.8 OR HIGHER
30% (12 OF 40) SCORED 8.8 OR HIGHER
17.5% (7 OF 40) SCORED 9.8 or HIGHER
17.5% (7 OF 40) HAD PERFECT 9.9 SCORES
20% (8 OF 40) SCORED *BELOW* THE 4.8 GRADE NORM IN READING COMPREHENSION
12.5% (5 OF 40) SCORED 3.8 OR LOWER

FIFTH GRADE STUDY

Table IX compares *C.T.B.S.* reading scores for target fifth graders tested in May, 1975, and May, 1976.

Table IX
Fifth Grade Classes Compared

Test	May, 1975 (N = 71)	May, 1976 (N = 43)	Difference
Vocabulary	7.3	7.5	+0.2
Comprehension	7.7	8.1	+0.4
Total Reading	7.5	7.8	+0.3

C.T.B.S., Level II, Form S, Grade Norm 5.8

TABLE IX SHOWS THAT IN EACH AREA OF READING THE 1976 FIFTH GRADERS SCORED HIGHER THAN DID FIFTH GRADERS A YEAR EARLIER. NOTE THAT THE AVERAGE FIFTH GRADER AT PATTERSON ROAD SCHOOL HAS A TOTAL READING SCORE TWO YEARS ABOVE THE 5.8 GRADE NORM AND A READING COMPREHENSION SCORE TWO YEARS AND THREE MONTHS HIGHER.

Table X shows the distribution of *Reading Comprehension* scores for target fifth graders as well as showing the mean pre and post test reading scores for those same 43 students. In addition to the 43 target students, there were May, 1976, test scores for 13 new fifth graders who had entered the school after May, 1975. Mean reading scores for those 13 students were: Vocabulary 6.4; Comprehension 7.7; and Total Reading 7.1. When these scores are included with those of the target group, mean reading scores for the school's 56 fifth graders are: Vocabulary 6.7, Comprehension 7.8; and Total Reading 7.3.

Table X
Grade Five

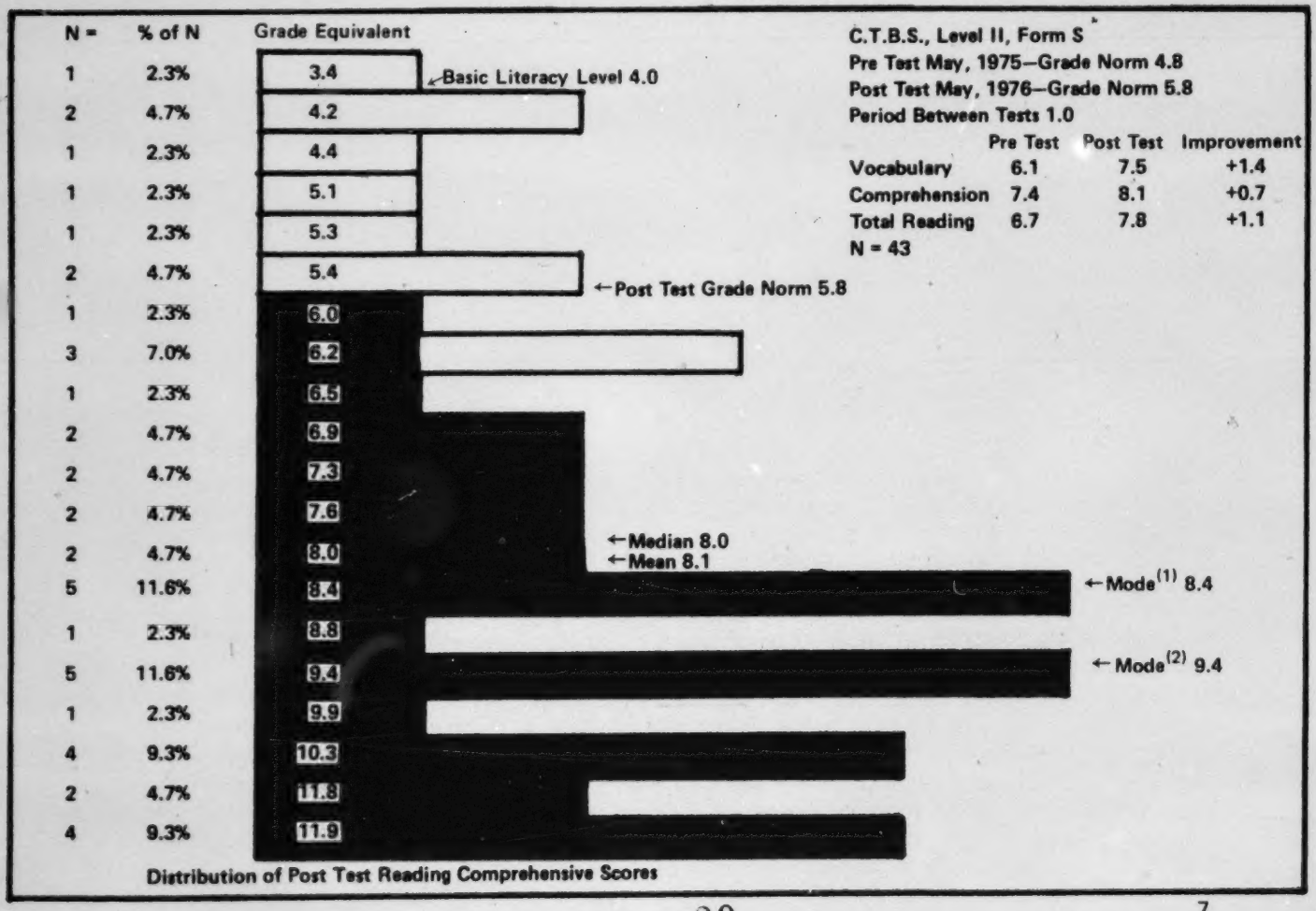


TABLE X SHOWS SCORES FOR 43 FIFTH GRADERS (NORM 5.8) DISTRIBUTED AS FOLLOWS:

81.4% (35 OF 43) SCORED *ABOVE* THE 5.8 GRADE NORM IN READING COMPREHENSION
69.8% (30 OF 43) SCORED 6.8 OR HIGHER
55.8% (24 OF 43) SCORED 7.8 OR HIGHER
39.5% (17 OF 43) SCORED 8.8 OR HIGHER
25.6% (11 OF 43) SCORED 9.8 OR HIGHER
14.0% (6 OF 43) SCORED 11.8 OR HIGHER
9.3% (4 OF 43) HAD PERFECT 11.9 SCORES
18.6% 8 OF 43) SCORED *BELOW* THE 5.8 GRADE NORM IN READING COMPREHENSION
9.3% (4 OF 43) SCORED 4.8 OR LOWER

SIXTH GRADE STUDY

The sixth grade class is the most impacted of all those at Patterson Road School. At the beginning of the fifth grade, in September, 1974, this group had to absorb 17 new students; and in the year between May, 1975, and May, 1976, 20 more students joined the group as sixth graders. A profile of the student population in the sixth grade classes follows—along with reading scores for the target students in each class. It is of particular interest to note that the greater the number of new and Educationally Handicapped students in a class, the lower the scores in *Reading Comprehension.*

Teacher	Students Tested 6/76	Old Students Enrolled 6/75	New Students Since 6/75	E. H. Students	Post Test Vocab.*	Post Test Comp.*	Post Test T. R.*
A	27	22	3	2	8.3	9.2	8.8
B	32	25	6	1	8.5	8.8	8.6
C	29	14	11	4	8.3	7.5	7.9
TOTALS	88	61 (69.3%)	20 (22.7%)	7 (8%)	8.4	8.6	8.5

***Target Students Only**

Table XI compares *C.T.B.S.* reading scores for target sixth graders tested in May, 1975, and May, 1976.

Table XI
Sixth Grade Classes Compared

Test	May, 1975 (N = 58)	May, 1976 (N = 61)	Difference
Vocabulary	8.3	8.4	+0.1
Comprehension	9.1	8.6	−0.5
Total Reading	8.8	8.5	−0.3

C.T.B.S. Level II, Form S, Grade Norm 6.8

TABLE XI SHOWS A DECLINE OF FIVE MONTHS IN READING COMPREHENSION, THREE MONTHS IN TOTAL READING, AND IMPROVEMENT OF ONE MONTH IN READING VOCABULARY BETWEEN THE SIXTH GRADE CLASSES IN 1975 AND 1976. NOTE THAT THE AVERAGE GRADUATING SIXTH GRADER AT PATTERSON ROAD SCHOOL SCORED ABOVE THE GRADE NORM OF 6.8 ONE YEAR AND SIX MONTHS IN VOCABULARY; ONE YEAR AND EIGHT MONTHS IN COMPREHENSION; AND ONE YEAR AND SEVEN MONTHS IN TOTAL READING. DURING THE FOUR TEST PERIODS BEFORE THE PROGRAM BEGAN (1969–1973), THE AVERAGE SIXTH GRADER SCORED 6.3 IN TOTAL READING WHEN TESTED EACH MAY.

Table XII shows the distribution of *Reading Comprehension* scores for target sixth graders as well as showing the mean pre and post test reading scores for those same 61 students. In addition to the 61 target students, there were May, 1976, test scores for 20 new sixth graders who had entered the school after May, 1975. Mean reading scores for these 20 students were: Vocabulary 7.8; Comprehension 7.4; and Total Reading 7.6. When these scores are included with those of the target group, mean reading scores for the school's 81 sixth graders are: Vocabulary 8.2; Comprehension 8.3; and Total Reading 8.3.

Table XII
Grade Six

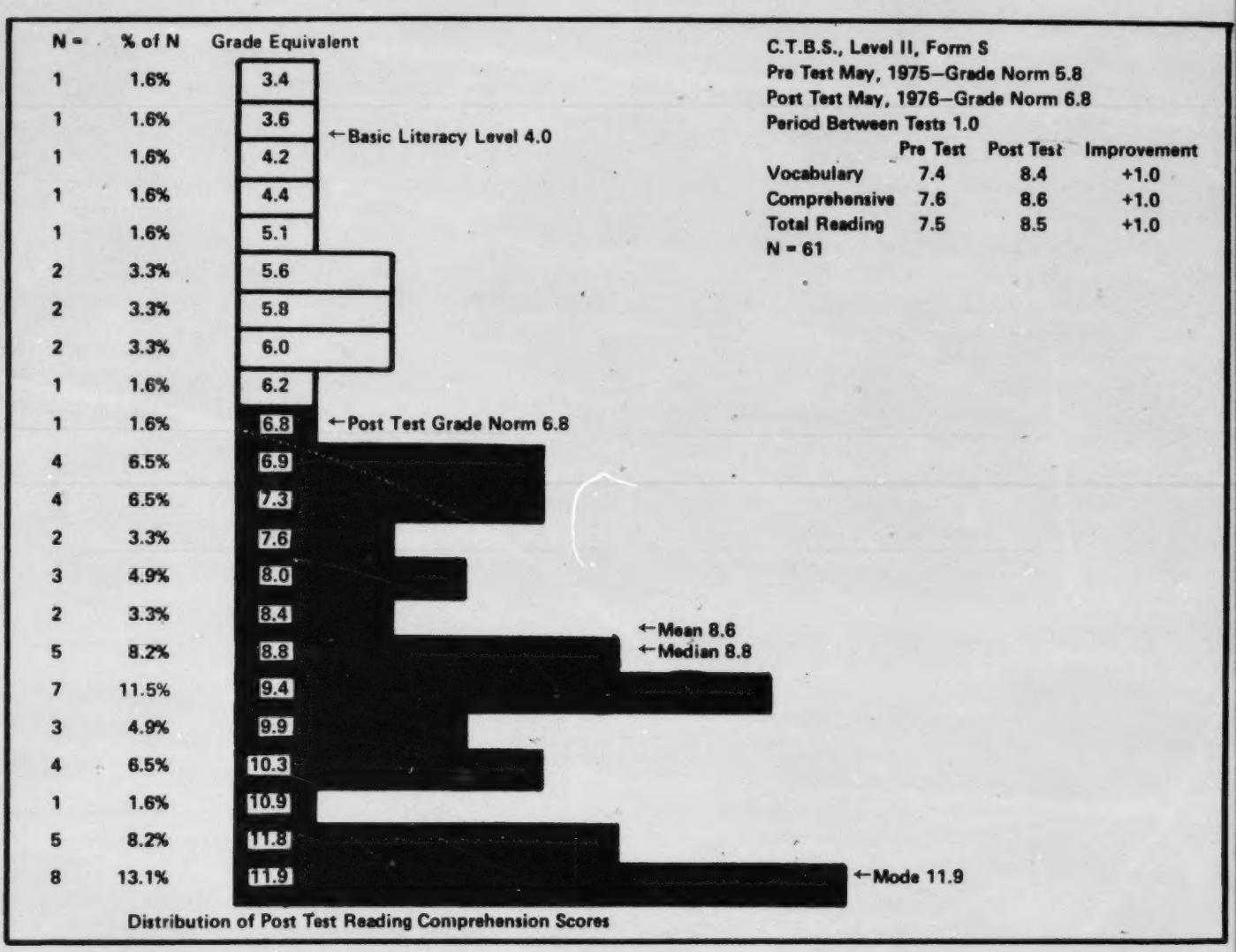


TABLE XII SHOWS SCORES FOR 61 SIXTH GRADERS (NORM 6.8) DISTRIBUTED AS FOLLOWS:

80.3% (49 OF 61) SCORED *ABOVE* THE 6.8 GRADE NORM IN READING COMPREHENSION
62.3% (38 OF 61) SCORED 7.8 OR HIGHER
54.1% (33 OF 61) SCORED 8.8 OR HIGHER
34.4% (21 OF 61) SCORED 9.8 OR HIGHER
22.9% (14 OF 61) SCORED 10.8 OR HIGHER
19.7% (12 OF 61) SCORED 11.8 OR HIGHER
13.1% (8 OF 61) HAD PERFECT 11.9 SCORES
19.7% (12 OF 61) SCORED *BELOW* THE 6.8 GRADE NORM IN READING COMPREHENSION
14.8% (9 OF 61) SCORED 5.8 OR LOWER
6.6% (4 OF 61) SCORED 4.8 OR LOWER

Budget Considerations

During the period of this study—May, 1975 through May, 1976—the school spent exactly $170.00 for Formula Phonics materials. Another $250.00 was budgeted for the purchase of paperback books for use in the Reading Chain Dialog Groups and in the classrooms. Because all Formula Phonics teaching, both in the Reading Chain and in the classrooms, was conducted by the school's staff as a regular part of their teaching assignments, no monies had to be budgeted for either certificated or classified salaries to support the program.

Summary

An indepth study of the Formula Phonics Reading Chain Program at Patterson Road School was made to determine whether the "Hawthorne Effect," or any other factors, were working to depress the program's success as measured by student scores on standardized reading tests. The data was also treated to show the Total Reading scores for all second and third graders and the Reading Comprehension scores for the target fourth, fifth, and sixth graders. The study shows that the Formula Phonics Reading Chain Program has worked to nearly eliminate reading disability in regular students at Patterson Road School.

- Of *all* second graders, only 3 of 46 (6.5%) scored more than one year below the 2.6 grade norm.
- Of *all* third graders, only 5 of 57 (8.7%) scored more than one year below the 3.6 grade norm.
  - *Of target third graders, only 16 of 57 (28%) scored below the level of effective literacy, 4.0.*
- Of target fourth graders, only 4 of 40 (10%) scored more than one year below the 4.8 grade norm.
  - *Of target fourth graders, only 4 of 40 (10%) scored below the level of effective literacy, 4.0.*
- Of target fifth graders, only 4 of 43 (9.3%) scored more than one year below the 5.8 grade norm.
  - *Of target fifth graders, only 1 of 43 (2.3%) scored below the level of effective literacy, 4.0.*
- Of target sixth graders, only 7 of 61 (11.5%) scored more than one year below the 6.8 grade norm.
  - *Of target sixth graders, only 2 of 61 (3.3%) scored below the level of effective literacy, 4.0.*

SCHOOL-WIDE ONLY 23 OF 247 (9.3%) SECOND THROUGH SIXTH GRADERS SCORED MORE THAN ONE YEAR BELOW GRADE NORMS.

SCHOOL-WIDE ONLY 7 OF 144 (4.9%) FOURTH, FIFTH, AND SIXTH GRADERS SCORED BELOW THE LEVEL OF EFFECTIVE LITERACY, 4.0.

So far as replicating earlier levels of achievement, second and third graders had the same Total Reading scores as did target students of those grade levels a year before; fourth graders scored five months higher; fifth graders scored three months higher; and sixth graders scored three months lower. Mean Total Reading scores for all second graders were six months *above* grade norms. Mean Reading Comprehension scores for all third graders were 18 months *above* grade norm. Mean Reading Comprehension scores for target fourth graders were 24 months *above* grade norm; and for target sixth graders were 18 months *above* grade norm. Obviously, neither the "Hawthorne Effect" nor any other factor has worked during the past year to diminish the effectiveness of the Formula Phonics Reading Chain Program at Patterson Road Elementary School.

Patterson Road School Profile

Orcutt is a semi-rural suburb of Santa Maria, California, a city close to the space complex at Vandenberg Air Force Base. The students are generally majority ethnic and come from upper-lower and lower-middle income homes. The transiency rate at Patterson Road School is very high. The school is paired with another school which sends its Educationally Handicapped and Learning Disability Group boys and girls during the course of the school year as they are identified. As the program has matured, the parents have become ever more supportive of the school's efforts.

Ethnic Distribution—June, 1976

White/Not Spanish Surnamed 407 (94.65%), Spanish Surnamed 18 (4.19%); Black 3 (0.69%); Oriental 2 (0.46%). Total enrollment 430. Combined minority students 23 (5.35%).

S.E.S. Data from April, 1975, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 75
Parent Education Index—
State Percentile Rank 74

Reading Test Results from April, 1975, California Assessment Program Report

(After two and one-half years of the Formula Phonics Reading Chain Program)
Grade 2—State Percentile Rank 93
Grade 3—State Percentile Rank 96
Grade 6—State Percentile Rank 92

Spelling

Grade 6—State Percentile Rank 95

Funding

Only district and state general funds are used for Formula Phonics materials

Primary Reading Program in Grades K—1

Lippencott and Formula Phonics

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The Formula Phonics Reading Chain Programs in the Elementary Schools of the Atascadero, California Unified School District

School Year—1975-1976

The Program

In September, 1975, Formula Phonics Reading Chain Programs were started in the four regular elementary schools in the Atascadero Unified School District. The program broke new ground in three areas. First, it was selected, implemented, and is administered by district-level administration. Second, it was instituted district-wide. And, third, video programs and teaching manuals alone were used in all phases of program design and for initial staff development. Program design and initial staff development were accomplished in about two weeks, on-site, at each school. After staffs were trained, they used ten video programs, shown over a period of about three weeks, to fund *every* target student with the specific phonetic information which is used in the Formula Phonics reading and spelling systems.

By this means over half of the district's second graders, some three-fourths of the third graders, and virtually all of the fourth, fifth, and sixth graders, along with their teachers and school administrators, became interchangeable. That is, every central or elementary building level administrator in the district could design, administer, maintain, and evaluate a Reading Chain program in any school; every teacher could teach reading, spelling, and other language processing skills in a prescribed way to groups of students of any grade or reading ability level whether in a Reading Chain Dialog Group or in a self-contained classroom; and any student could work equally well with any group of students of his own reading ability level in a Reading Chain group, or of his own grade level in a classroom, in any one of the four schools. In Atascadero every administrator, reading specialist, regular teacher, special education teacher, and instructional aide in the program teaches exactly the same decoding, spelling, and basic language processing strategies so that no teacher ever extinguishes the work of another. Instead, every teacher reinforces the work of every other teacher.

The effect of this kind of standardization of program and teaching on the students in Atascadero has been substantial. Educators in that district have accomplished in one school year what earlier Formula Phonics Reading Chain Programs accomplished in their second or third year. For example, after the first eight months of the program the district-wide scores in Total Reading for the fifth and sixth graders was one year above grade norms for the date when they were tested. Significantly, only 17 of 243 (7%) of the target sixth graders in the four schools had post test scores in Total Reading *below* the generally accepted level of literacy score of 4.0.

There appear to be a number of factors present in the Atascadero program which explain why it has matured so quickly:

1. *Administration*—Because the program is well administered, at both the district and building level, the prescribed (and essential) Reading Chain program design and Formula Phonics teaching strategies are followed exactly.

2. *Teachers*—Because teachers in Atascadero are a well-read, highly competent group of educators, they are able to provide a rich learning atmosphere in the Reading Chain groups and in the home-rooms.

3. *Coordination*—Because the teachers who coordinate the program in the schools are reading specialists, they are able to provide the program with a high level of intra and inter school support.

4. *Spelling Component*—Because every staff member who participates in the program has been trained to integrate the Formula Phonics spelling-writing strategies into his or her teaching, there is assured

Table I
District-Wide Elementary Reading Program
School Year 1975-1976

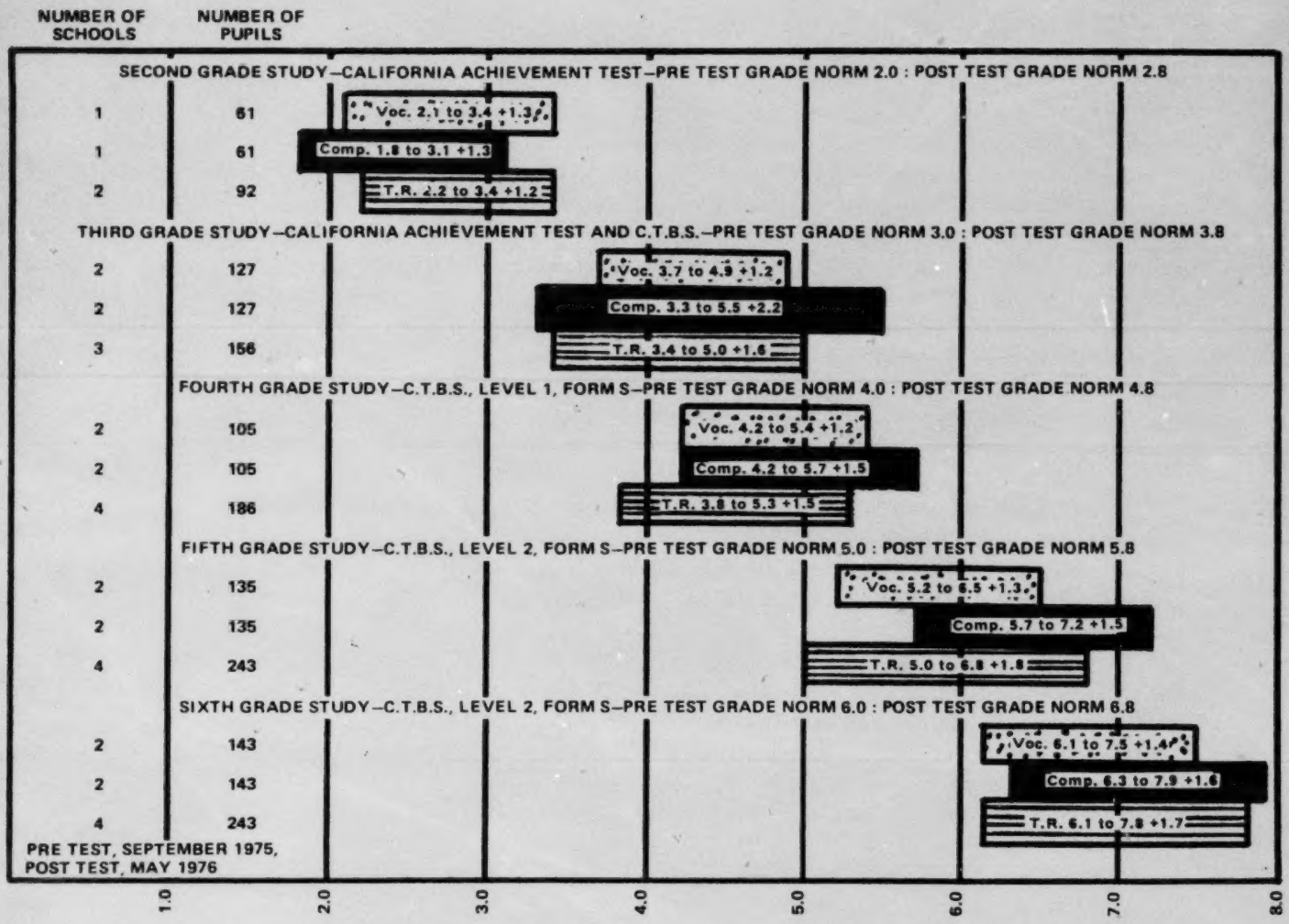

NUMBER OF SCHOOLS
NUMBER OF PUPILS
SECOND GRADE STUDY—CALIFORNIA ACHIEVEMENT TEST—PRE TEST GRADE NORM 2.0 : POST TEST GRADE NORM 2.8
1 61 Voc. 2.1 to 3.4 +1.3
1 61 Comp. 1.8 to 3.1 +1.3
2 92 T.R. 2.2 to 3.4 +1.2
THIRD GRADE STUDY—CALIFORNIA ACHIEVEMENT TEST AND C.T.B.S.—PRE TEST GRADE NORM 3.0 : POST TEST GRADE NORM 3.8
2 127 Voc. 3.7 to 4.9 +1.2
2 127 Comp. 3.3 to 5.5 +2.2
3 156 T.R. 3.4 to 5.0 +1.6
FOURTH GRADE STUDY—C.T.B.S., LEVEL 1, FORM S—PRE TEST GRADE NORM 4.0 : POST TEST GRADE NORM 4.8
2 105 Voc. 4.2 to 5.4 +1.2
2 105 Comp. 4.2 to 5.7 +1.5
4 186 T.R. 3.8 to 5.3 +1.5
FIFTH GRADE STUDY—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 5.0 : POST TEST GRADE NORM 5.8
2 135 Voc. 5.2 to 6.5 +1.3
2 135 Comp. 5.7 to 7.2 +1.5
4 243 T.R. 5.0 to 6.8 +1.8
SIXTH GRADE STUDY—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 6.0 : POST TEST GRADE NORM 6.8
2 143 Voc. 6.1 to 7.5 +1.4
2 143 Comp. 6.3 to 7.9 +1.6
4 243 T.R. 6.1 to 7.8 +1.7
PRE TEST, SEPTEMBER 1975,
POST TEST, MAY 1976
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0

TABLE I REFLECTS DISTRICT-WIDE STUDENT ACHIEVEMENT IN READING AFTER THE FIRST YEAR OF ATASCADERO'S FORMULA PHONICS READING CHAIN PROGRAM. EDUCATORS ACKNOWLEDGE THAT AVERAGE STUDENTS, SUCH AS THOSE IN ATASCADERO, GENERALLY IMPROVE IN TOTAL READING ONE MONTH FOR EACH MONTH'S INSTRUCTION. NOTE: AFTER EIGHT MONTHS IN READING CHAINS 2ND GRADERS IN ATASCADERO IMPROVED AN AVERAGE OF 12 MONTHS; 3RD GRADERS IMPROVED 16 MONTHS; 4TH GRADERS IMPROVED 15 MONTHS; 5TH GRADERS IMPROVED 18 MONTHS; AND 6TH GRADERS IMPROVED 17 MONTHS.

DISTRICT-WIDE THE 915 STUDENTS FROM THE FOUR ELEMENTARY SCHOOLS FOR WHOM PRE AND POST TEST SCORES WERE AVAILABLE IMPROVED WHILE IN THE PROGRAM AN AVERAGE OF 16 MONTHS. THIS REPRESENTS TWO MONTHS GROWTH IN TOTAL READING FOR EACH MONTH OF INSTRUCTION.

a systematic learning of the phonetic system. This in turn permits teachers to spend more time teaching language processing skills and less time teaching decoding skills.

5. *Video Programs*—Because the six new Formula Phonics program design-staff development video programs were used district-wide for the first time in Atascadero, there was achieved a standardization of all elements of the program.

Program Evaluation

The data from the Formula Phonics Reading Chain Program in Atascadero is highly significant. It is treated beyond in tables dealing with the total target population (all students for whom there are pre and post tests in Total Reading); with all students who achieved below grade norm on the pre test; with the target population in each school; with the four schools compared; and with each individual target second and third grader.

Pre testing was in September, 1975, and post testing was in May, 1976—a period of eight months. In two schools second and third graders were tested with the *California Achievement Test (C.A.T.);* third graders in another school and all fourth, fifth, and sixth graders were tested with the *Comprehensive Test of Basic Skills (C.T.B.S.).* Tests were hand scored in each school and summary sheets sent to the central administrative office.

Unfortunately, pre test Vocabulary and Comprehension scores for all students at two schools were destroyed. Additionally, certain of the post test Vocabulary and Comprehension scores at one of those schools were also destroyed. Hence, only Total Reading scores were available to evaluate achievement for all of the 915 target students.

The data in Table I is particularly significant because many of the outcomes are so similar to those found in a number of other well-designed Reading Chain programs in schools in other districts. As in those other programs, growth in Reading Comprehension exceeds that for Reading Vocabulary; second graders achieve at a slower rate than any other grade level; and fifth and sixth graders exceeded two months growth for each month of instruction.

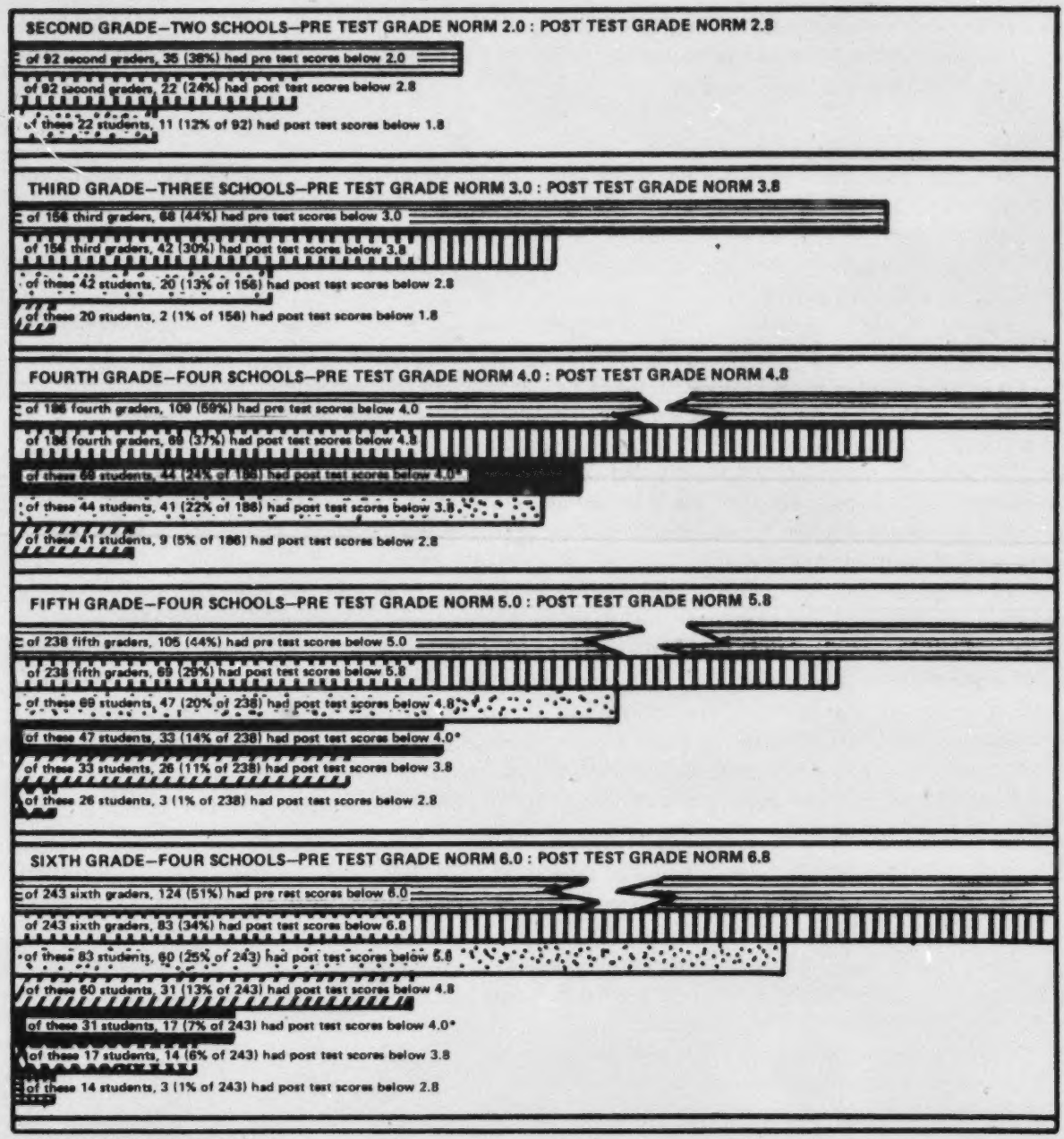
Although the data displayed in Table I is impressive, that found in Table II has even greater educational import. Table II shows that, district-wide, the educators in Atascadero are embarked on a course which will lead to the near elimination of specific reading disability in their schools over the next few years. The district-wide evidence for this conclusion is most persuasive.

- Only 14% (94 of 667) of the district's fourth, fifth, and sixth graders had post test *C.T.B.S.* Total Reading scores below the generally accepted level of literacy competence which is 4.0.
- Only 10% (50 of 481) of the district fifth and sixth graders had post test *C.T.B.S.* Total Reading Scores below 4.0.
- Only 7% (17 of 243) of the sixth graders had post test *C.T.B.S.* Total Reading scores below 4.0.
- Only 20% (179 of 915) of all second through sixth graders had post test *C.T.B.S.* or *C.A.T.* Total Reading scores one year or more below grade norms.
- Only 8% (68 of 823) of all third through sixth graders had post test *C.T.B.S.* or *C.A.T.* Total Reading scores two years or more below grade norms.

The true significance of these scores can be appreciated when it is learned that data from Reading Chain programs in schools in other districts shows a pattern of acceleration in growth of reading and language ability over time.

Tables III, IV, V, and VI treat with each of the four schools separately. Each table is preceded by a school profile with information concerning its initial reading programs, socio-economic index, ethnicity, and reading assessment percentile ranking. The socio-economic index and reading percentile ranks were taken from the April, 1975, California State Department of Education Assessment Program printouts. This was the final assessment made before the program began.

Table II—Total Reading
Educational Outcome—Below Grade Norm Population


SECOND GRADE—TWO SCHOOLS—PRE TEST GRADE NORM 2.0 : POST TEST GRADE NORM 2.8
of 92 second graders, 35 (38%) had pre test scores below 2.0
of 92 second graders, 22 (24%) had post test scores below 2.8
of these 22 students, 11 (12% of 92) had post test scores below 1.8
THIRD GRADE—THREE SCHOOLS—PRE TEST GRADE NORM 3.0 : POST TEST GRADE NORM 3.8
of 156 third graders, 68 (44%) had pre test scores below 3.0
of 156 third graders, 42 (30%) had post test scores below 3.8
of these 42 students, 20 (13% of 156) had post test scores below 2.8
of these 20 students, 2 (1% of 156) had post test scores below 1.8
FOURTH GRADE—FOUR SCHOOLS—PRE TEST GRADE NORM 4.0 : POST TEST GRADE NORM 4.8
of 186 fourth graders, 109 (59%) had pre test scores below 4.0
of 186 fourth graders, 69 (37%) had post test scores below 4.8
of these 69 students, 44 (24% of 186) had post test scores below 4.0*
of these 44 students, 41 (22% of 186) had post test scores below 3.8
of these 41 students, 9 (5% of 186) had post test scores below 2.8
FIFTH GRADE—FOUR SCHOOLS—PRE TEST GRADE NORM 5.0 : POST TEST GRADE NORM 5.8
of 238 fifth graders, 105 (44%) had pre test scores below 5.0
of 238 fifth graders, 69 (29%) had post test scores below 5.8
of these 69 students, 47 (20% of 238) had post test scores below 4.8
of these 47 students, 33 (14% of 238) had post test scores below 4.0*
of these 33 students, 26 (11% of 238) had post test scores below 3.8
of these 26 students, 3 (1% of 238) had post test scores below 2.8
SIXTH GRADE—FOUR SCHOOLS—PRE TEST GRADE NORM 6.0 : POST TEST GRADE NORM 6.8
of 243 sixth graders, 124 (51%) had pre test scores below 6.0
of 243 sixth graders, 83 (34%) had post test scores below 6.8
of these 83 students, 60 (25% of 243) had post test scores below 5.8
of these 60 students, 31 (13% of 243) had post test scores below 4.8
of these 31 students, 17 (7% of 243) had post test scores below 4.0*
of these 17 students, 14 (6% of 243) had post test scores below 3.8
of these 14 students, 3 (1% of 243) had post test scores below 2.8

*U.S.O.E.'S LEVEL OF LITERACY IS 4.0

TABLE II DISPLAYS THE DISTRIBUTION OF MAY, 1976, POST TEST TOTAL READING SCORES FOR THE SAME 441 (48% OF 915) WHO HAD SCORED BELOW GRADE NORMS ON THE SEPTEMBER, 1975 PRE TEST. THE 17 SIXTH GRADE STUDENTS WHO SCORED BELOW THE GENERALLY ACCEPTED LITERACY LEVEL OF 4.0 WERE DISTRIBUTED SO THAT 12 (14% of 83 GRADUATES) ATTENDED LEWIS AVENUE SCHOOL; 1 (2% OF 60 GRADUATES) ATTENDED MONTEREY ROAD SCHOOL; 4 (8% OF 48 GRADUATES) ATTENDED SANTA MARGARITA SCHOOL; AND 0 (0% OF 52 GRADUATES) ATTENDED SANTA ROSA SCHOOL. LEWIS AVENUE SCHOOL ALSO HAD THE HIGHEST NUMBER OF PERFECT 11.9 TOTAL READING SCORES (5), FOLLOWED BY MONTEREY ROAD SCHOOL (4), SANTA MARGARITA SCHOOL (3), AND SANTA ROSA SCHOOL (2).

Lewis Avenue School Profile

Lewis Avenue School is located in central Atascadero. All of its second through sixth graders take part in the Formula Phonics Reading Chain Program. Eleven classroom teachers, one Title I teacher, and one Miller-Unruh reading teacher participate in the Reading Chain.

Ethnic Distribution—April 1975
Spanish Surnamed 6.5%; Oriental .4%; White/Not Spanish Surnamed 93.1%

S.E.S. Data from April, 1975, California Assessment Program Report
Socio-Economic Index—
State Percentile Rank 48

Reading Test Results from 1975, California Assessment Program Report
(Before the Formula Phonics Reading Chain was instituted)
Grade 2—State Percentile Rank 54
Grade 3—State Percentile Rank 52
Grade 6—State Percentile Rank 36

K-1 Reading Program
Total Reading

Contact
Charles Wilbur, Principal
Lewis Avenue School
6495 Lewis Avenue
Atascadero, California 93422
(805) 466-0393

Table III
Lewis Avenue Elementary School

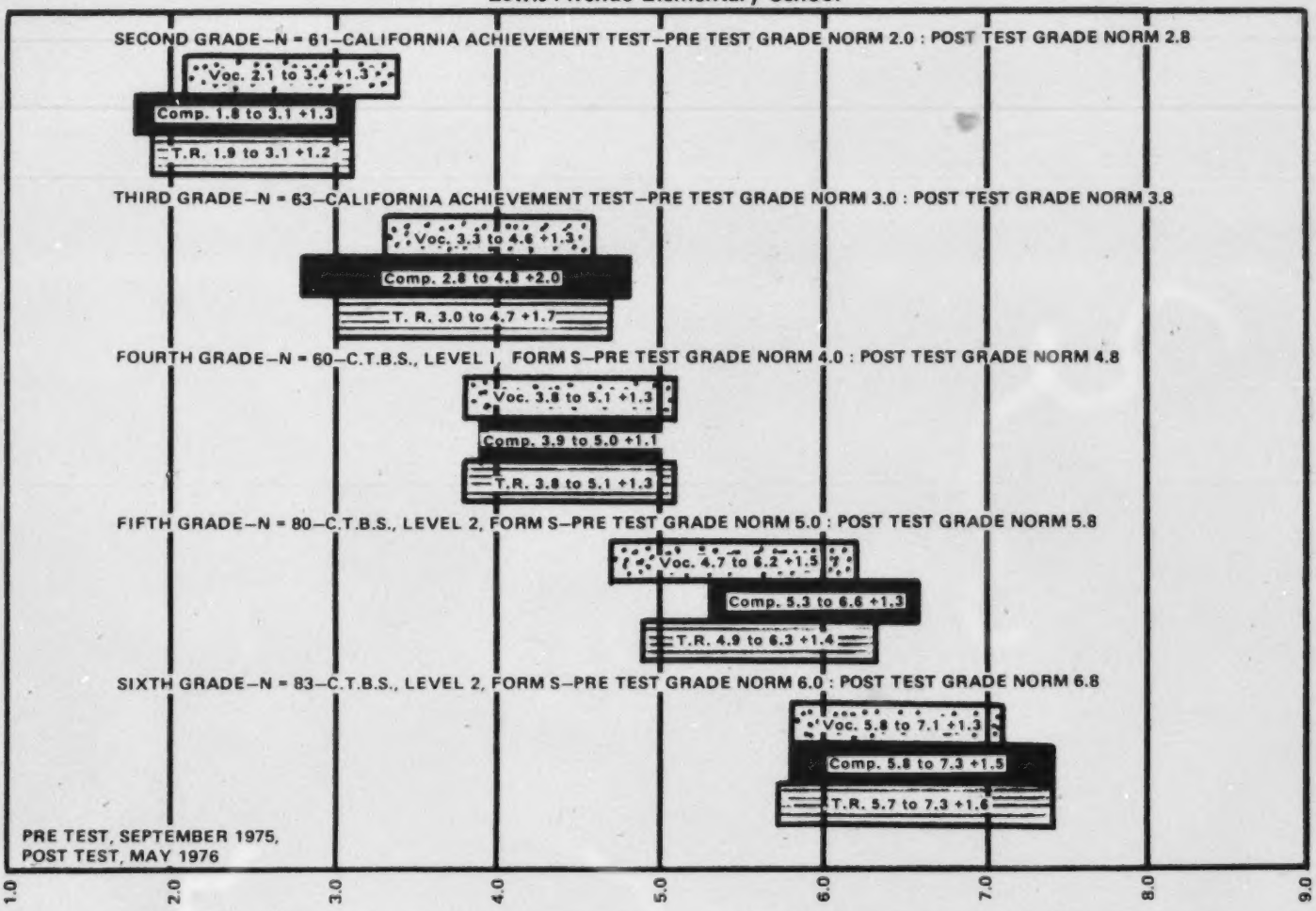

SECOND GRADE–N = 61–CALIFORNIA ACHIEVEMENT TEST–PRE TEST GRADE NORM 2.0 : POST TEST GRADE NORM 2.8
Voc. 2.1 to 3.4 +1.3
Comp. 1.8 to 3.1 +1.3
T.R. 1.9 to 3.1 +1.2
THIRD GRADE–N = 63–CALIFORNIA ACHIEVEMENT TEST–PRE TEST GRADE NORM 3.0 : POST TEST GRADE NORM 3.8
Voc. 3.3 to 4.6 +1.3
Comp. 2.8 to 4.8 +2.0
T. R. 3.0 to 4.7 +1.7
FOURTH GRADE–N = 60–C.T.B.S., LEVEL I, FORM S–PRE TEST GRADE NORM 4.0 : POST TEST GRADE NORM 4.8
Voc. 3.8 to 5.1 +1.3
Comp. 3.9 to 5.0 +1.1
T.R. 3.8 to 5.1 +1.3
FIFTH GRADE–N = 80–C.T.B.S., LEVEL 2, FORM S–PRE TEST GRADE NORM 5.0 : POST TEST GRADE NORM 5.8
Voc. 4.7 to 6.2 +1.5
Comp. 5.3 to 6.6 +1.3
T.R. 4.9 to 6.3 +1.4
SIXTH GRADE–N = 83–C.T.B.S., LEVEL 2, FORM S–PRE TEST GRADE NORM 6.0 : POST TEST GRADE NORM 6.8
Voc. 5.8 to 7.1 +1.3
Comp. 5.8 to 7.3 +1.5
T.R. 5.7 to 7.3 +1.6
PRE TEST, SEPTEMBER 1975,
POST TEST, MAY 1976
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

TABLE III DISPLAYS TEST DATA FROM THE DISTRICT'S LARGEST SCHOOL. THE S.E.S. INDEX AT LEWIS AVENUE SCHOOL IS SIGNIFICANTLY LOWER THAN THAT IN THE OTHER THREE SCHOOLS IN THE DISTRICT. NOTE THAT ELEVEN PRE TEST SCORES WERE *BELOW* GRADE NORMS BUT *ALL* POST TEST SCORES WERE ABOVE GRADE NORMS. THIS IS AN OUTSTANDING ACHIEVEMENT FOR A TITLE I SCHOOL.

Monterey Road School Profile

Monterey Road School is located north of downtown Atascadero in a newly developed part of the community. All of its third through sixth graders take part in the Formula Phonics Reading Chain Program. Most of the school's second graders are excluded from the Reading Chain because they participate in the Initial Teaching Alphabet program and many of them do not complete transition to standard orthography until late in the second grade. Eight classroom teachers and one Miller-Unruh reading teacher teach in the Reading Chain.

Ethnic Distribution—April, 1975

Native America .2%; Black 1.0%; Spanish Surnamed 4.3%; Oriental .5%; White/Not Spanish Surnamed 94.1%

S.E.S. Data from April, 1975, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 69

Reading Test Results from 1975, California Assessment Program Report

(Before the Formula Phonics Reading Chain Program was instituted)

Grade 2—State Percentile Rank 79
Grade 3—State Percentile Rank 54
Grade 6—State Percentile Rank 90*

*Monterey Road School was the pilot school for the district and started its program in the spring of 1975. These sixth graders had been in a Reading Chain about two months before they were tested in April, 1975.

K-2 Reading Program

Initial Teaching Alphabet (I.T.A.)

Contact

Gregory Howe, Principal
3355 Monterey Road
Atascadero, California 93422
(805) 466-0393

Table IV

Monterey Road Elementary School

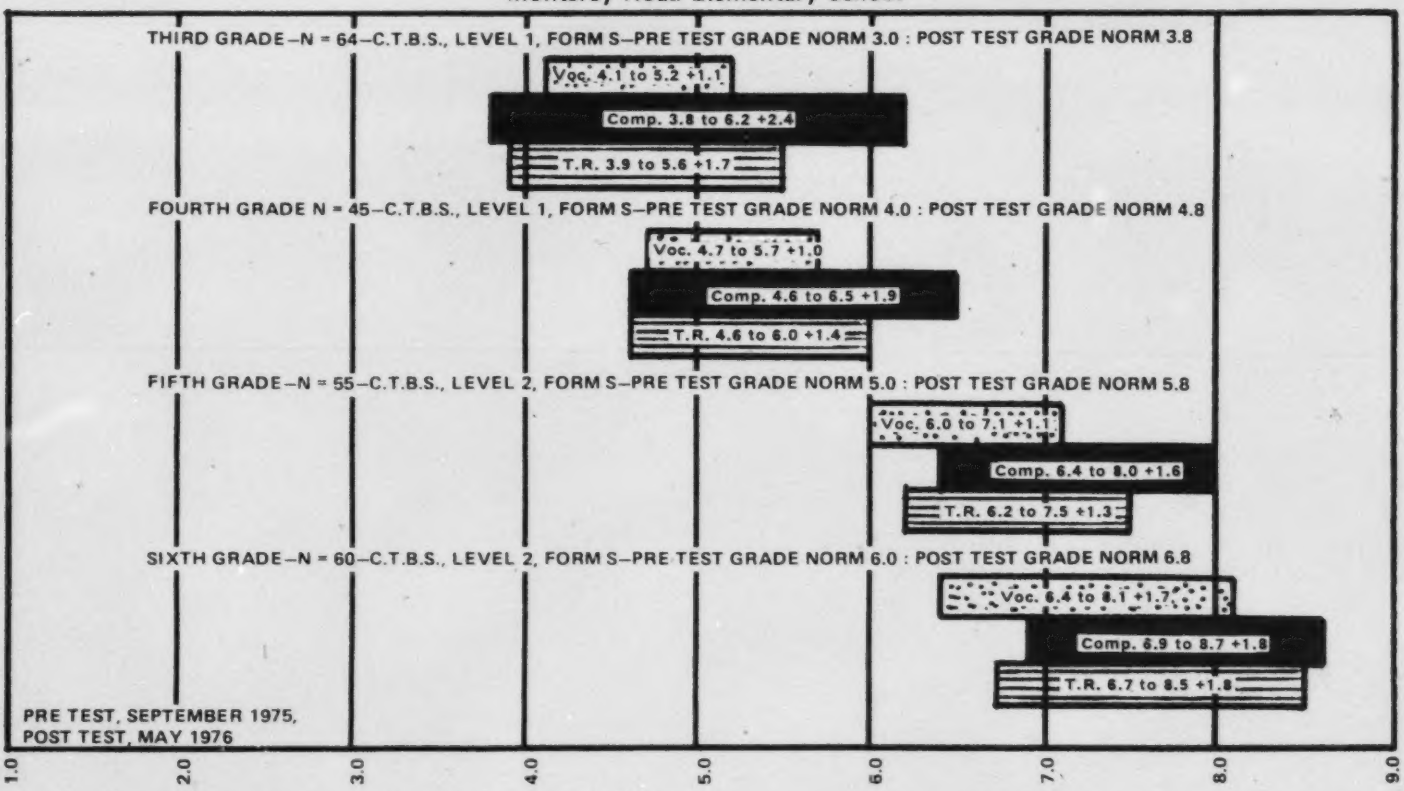

THIRD GRADE—N = 64—C.T.B.S., LEVEL 1, FORM S—PRE TEST GRADE NORM 3.0 : POST TEST GRADE NORM 3.8
Voc. 4.1 to 5.2 +1.1
Comp. 3.8 to 6.2 +2.4
T.R. 3.9 to 5.6 +1.7
FOURTH GRADE N = 45—C.T.B.S., LEVEL 1, FORM S—PRE TEST GRADE NORM 4.0 : POST TEST GRADE NORM 4.8
Voc. 4.7 to 5.7 +1.0
Comp. 4.6 to 6.5 +1.9
T.R. 4.6 to 6.0 +1.4
FIFTH GRADE—N = 55—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 5.0 : POST TEST GRADE NORM 5.8
Voc. 6.0 to 7.1 +1.1
Comp. 6.4 to 8.0 +1.6
T.R. 6.2 to 7.5 +1.3
SIXTH GRADE—N = 60—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 6.0 : POST TEST GRADE NORM 6.8
Voc. 6.4 to 8.1 +1.7
Comp. 6.9 to 8.7 +1.8
T.R. 6.7 to 8.5 +1.8
PRE TEST, SEPTEMBER 1975,
POST TEST, MAY 1976
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

TABLE IV DISPLAYS TEST DATA FROM THE DISTRICT'S PILOT READING CHAIN SCHOOL. MONTEREY ROAD SCHOOL HAS THE HIGHEST S.E.S. INDEX IN THE DISTRICT AND THE HIGHEST PRE AND POST TEST SCORES. NOTE THE 24 MONTHS GROWTH IN READING COMPREHENSION SHOWN BY THE THIRD GRADERS AFTER THEY MOVED FROM THE I.T.A. PROGRAM TO THE FORMULA PHONICS READING CHAIN PROGRAM.

Santa Margarita School Profile

Santa Margarita School is located in the small community of Santa Margarita which is about eight miles south of Atascadero. All of its second through sixth graders take part in the Formula Phonics Reading Chain Program. Seven classroom teachers and one Title I reading teacher participate in the Reading Chain.

Ethnic Distribution—April, 1975

Native American .4%; Black .4%; Spanish Surnamed 7.3%; White/Not Spanish Surnamed 91.2%; Other .4%

S.E.S. Data from April, 1975, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 62

Reading Test Results from 1975, California Assessment Program Report
(Before the Formula Phonics Reading Chain Program was instituted)

Grade 2—State Percentile Rank 44
Grade 3—State Percentile Rank 47
Grade 6—State Percentile Rank 37

K-1 Reading Program

Phonovisual

Contact

Mrs. A. Kris Dermott, Principal
Santa Margarita School
Post Office Box X
Santa Margarita, California 93454
(805) 438-5633

Table V
Santa Margarita Elementary School

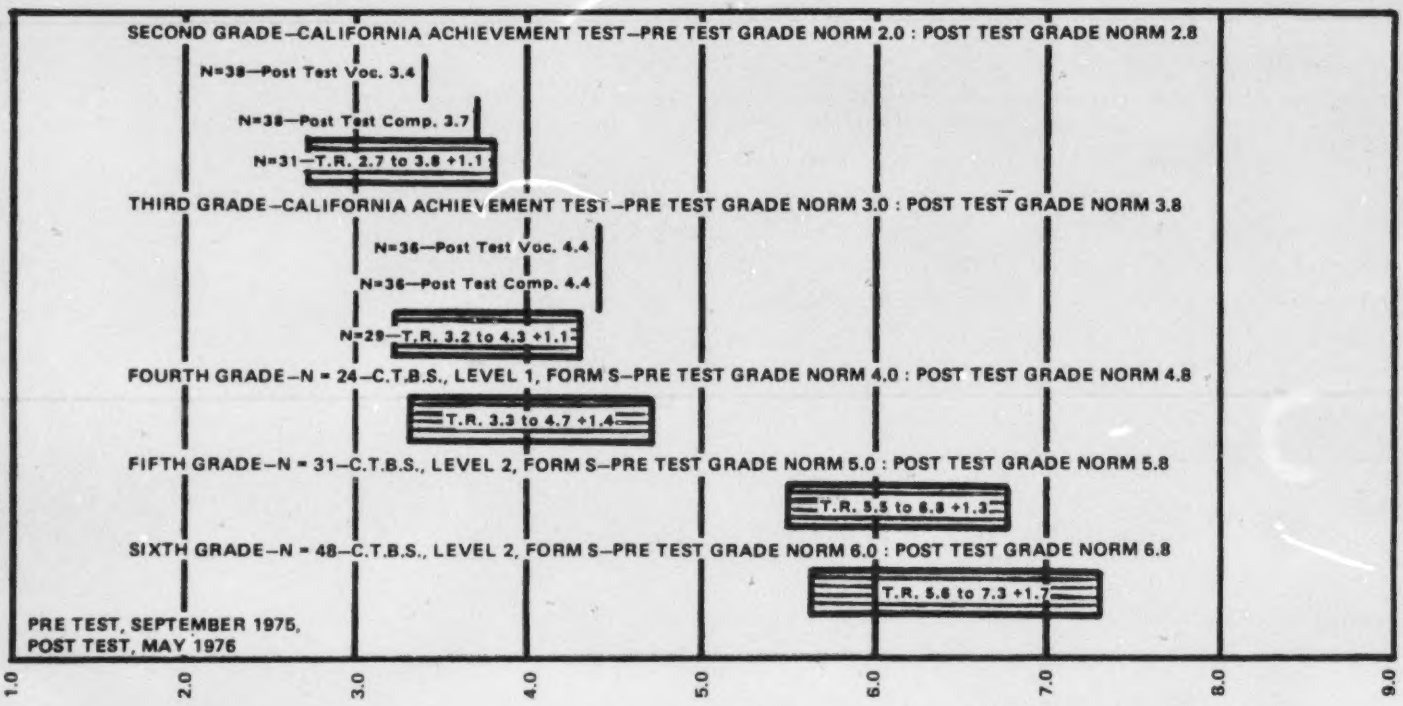

SECOND GRADE—CALIFORNIA ACHIEVEMENT TEST—PRE TEST GRADE NORM 2.0 : POST TEST GRADE NORM 2.8
N=38—Post Test Voc. 3.4
N=38—Post Test Comp. 3.7
N=31—T.R. 2.7 to 3.8 +1.1
THIRD GRADE—CALIFORNIA ACHIEVEMENT TEST—PRE TEST GRADE NORM 3.0 : POST TEST GRADE NORM 3.8
N=36—Post Test Voc. 4.4
N=36—Post Test Comp. 4.4
N=29—T.R. 3.2 to 4.3 +1.1
FOURTH GRADE—N = 24—C.T.B.S., LEVEL 1, FORM S—PRE TEST GRADE NORM 4.0 : POST TEST GRADE NORM 4.8
T.R. 3.3 to 4.7 +1.4
FIFTH GRADE—N = 31—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 5.0 : POST TEST GRADE NORM 5.8
T.R. 5.5 to 6.8 +1.3
SIXTH GRADE—N = 48—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 6.0 : POST TEST GRADE NORM 6.8
T.R. 5.6 to 7.3 +1.7
PRE TEST, SEPTEMBER 1975,
POST TEST, MAY 1976
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

TABLE V DISPLAYS TEST DATA FROM THE ONLY DISTRICT SCHOOL IN THIS STUDY WHICH IS CLASSIFIED AS BEING "RURAL." THE SCHOOL SERVES BOTH A TITLE I AND A RATHER AFFLUENT STUDENT POPULATION. SANTA MARGARITA IS THE SMALLEST SCHOOL IN THIS STUDY.

Santa Rosa School Profile

Santa Rosa Road School is located southwest of downtown Atascadero in a settled area of the community. All of its fourth through sixth graders take part in the program. Santa Rosa Road School is the district's Early Childhood Education (E.C.E.) site. Because of a misunderstanding concerning the state E.C.E. guidelines, its second and third graders were not placed in the Reading Chain program. However, the matter has been clarified and in September, 1976, its second and third graders will enter into the program. Six classroom teachers and one Miller-Unruh reading teacher participate in the Reading Chain.

Ethnic Distribution—April, 1975

Black 1.0%; Spanish Surnamed 2.7%; Oriental .7%; White/Not Spanish Surnamed 93.7%; Other 1.9%

S.E.S. Data from April, 1975, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 62

Reading Test Results from 1975, California Assessment Program Report

(Before the Formula Phonics Reading Chain Program was instituted)

Grade 2—State Percentile Rank 33
Grade 3—State Percentile Rank 55
Grade 6—State Percentile Rank 60

K-3 Reading Program

Read, Linguistics Approach to Reading (American Book Co.)

Contact

Dan Ross, Principal
Santa Rosa School
9205 Santa Rosa Road
Atascadero, California 93422
(805) 466-0393

Table VI
Santa Rosa Road Elementary School

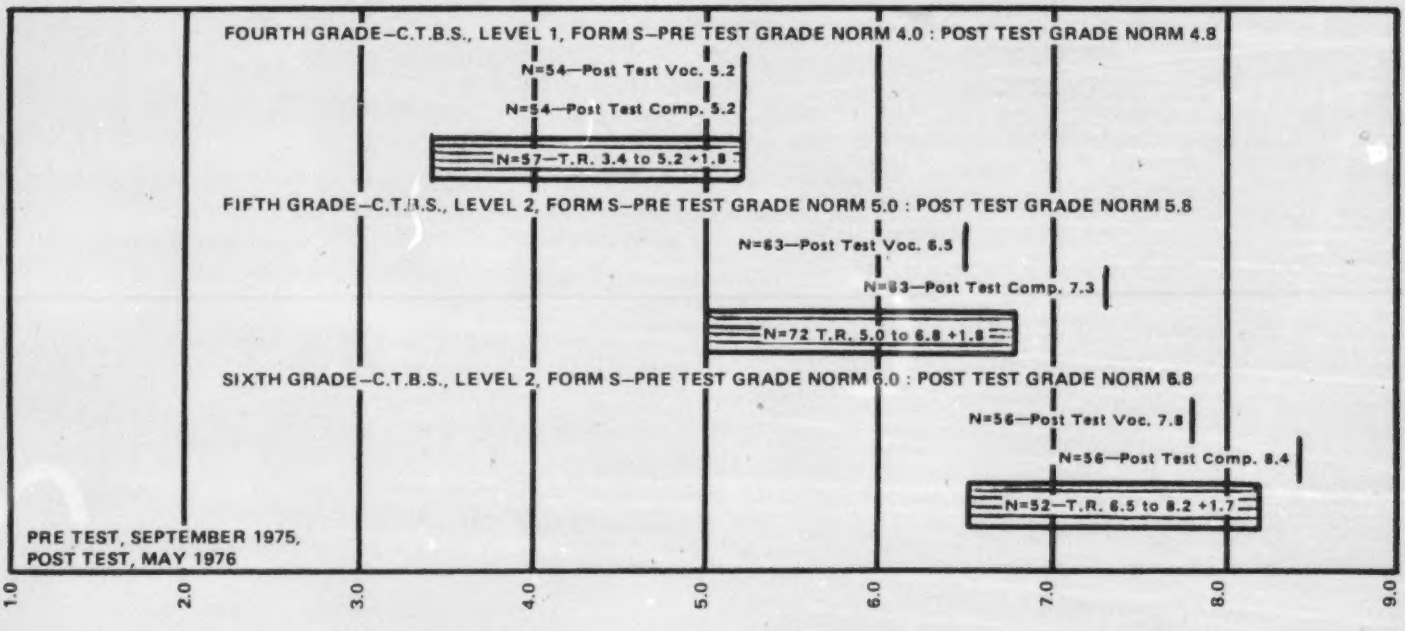

FOURTH GRADE—C.T.B.S., LEVEL 1, FORM S—PRE TEST GRADE NORM 4.0 : POST TEST GRADE NORM 4.8
N=54—Post Test Voc. 5.2
N=54—Post Test Comp. 5.2
N=57—T.R. 3.4 to 5.2 +1.8
FIFTH GRADE—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 5.0 : POST TEST GRADE NORM 5.8
N=63—Post Test Voc. 6.5
N=63—Post Test Comp. 7.3
N=72 T.R. 5.0 to 6.8 +1.8
SIXTH GRADE—C.T.B.S., LEVEL 2, FORM S—PRE TEST GRADE NORM 6.0 : POST TEST GRADE NORM 6.8
N=56—Post Test Voc. 7.8
N=56—Post Test Comp. 8.4
N=52—T.R. 6.5 to 8.2 +1.7
PRE TEST, SEPTEMBER 1975,
POST TEST, MAY 1976
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

TABLE VI DISPLAYS TEST DATA FROM SANTA ROSA ROAD SCHOOL. ON THE PRE TEST 8 OF 52 (15%) SIXTH GRADERS HAD TOTAL READING SCORES BELOW 4.0. ON THE POST TEST *NO* SIXTH GRADER HAD A TOTAL READING SCORE BELOW 4.0 AND ONLY 5 OF 52 (10%) HAD READING SCORES BELOW 5.0.

Table VII shows growth in Total Reading for each of the four district schools and also shows the district mean at each grade level. Because there is so little ethnicity in the district, differences in educational outcomes for the four schools (as measured by the pre test reading scores) can probably be attributed to differences in socio-economic class, primary reading programs, and student mobility.

In terms of program effectiveness the data in Table VII is particularly important. This is because at every school, and at every grade level, growth in Total Reading improved at about the same rate. Except in one case (the third graders at Santa Margarita School) the improvement in Total Reading at each school and at each grade level is no more than three months above or below the district average. From this it can be seen that the Formula Phonics Reading Chain Program leveled differences occasioned by socio-economic class, initial reading programs, student mobility, and entering level of reading attainment. The program is seen to be *equally effective* in each of the district's four Formula Phonics Reading Chain Schools.

Atascadero Unified School District Profile

Atascadero is a rural, unincorporated community. The population is 16,500 and growing. The school population, unlike most other districts, is increasing rapidly. The community is 16 miles inland and 20 miles from the largest urban area in San Luis Obispo County, which is the city of San Luis Obispo. The area provides a large variety of opportunity for educational and cultural experiences for children, both locally as well as within field trip distance. These include museums, Red Wind Indian School, Tamale Factory, ranches, farms, parks, radar station, ocean, zoo, lake, Coast Guard, state forestry, state hospital, air base, Hearst Castle, and general commercial businesses.

Ethnic Distribution—April, 1975

Native American .19%; Black .63%; Spanish Surnamed 4.89%; Oriental .80%; White/Not Spanish Surnamed 92.14%; Other 1.35%

S.E.S. Data from April, 1975, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 67

Reading Test Results from 1975, California Assessment Program Report
(Before the Formula Phonics Reading Chain Program was instituted)

Grade 2—State Percentile Rank 53
Grade 3—State Percentile Rank 56
Grade 6—State Percentile Rank 62

Contacts

For the district

Dr. David Gray, Superintendent
Dr. Theron P. McCarty, Assistant Superintendent, Instruction and Personnel
Mr. O. Paul Anderson, Director of Special Services
Atascadero Unified School District
6800 Lewis Avenue
Atascadero, California 93422
(805) 466-0393

For Integrative Learning Systems, Inc.

Edward O. Vail, President and Senior Author, Formula Phonics Programs
Integrative Learning Systems, Inc.
326 West Chevy Chase Drive, No. 11
Glendale, California 91204
(213) 243-2675

Table VII—Four School Study
Growth in Total Reading

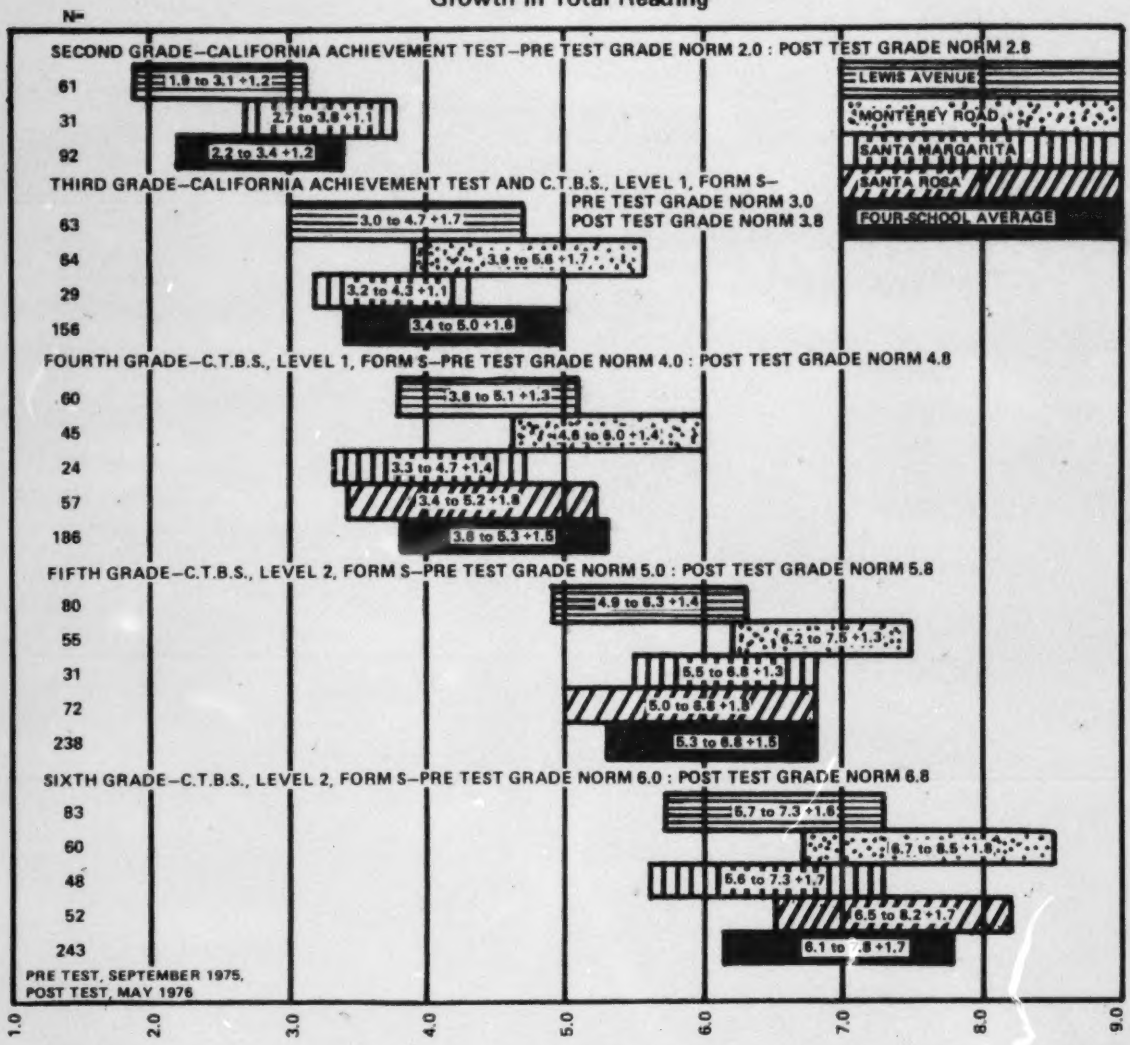


TABLE VII SHOWS GROWTH IN TOTAL READING FOR THE 17 GRADE LEVEL GROUPS IN THE FOUR SCHOOLS. NOTE HOW WELL THE PROGRAM SERVED THE VARIED POPULATIONS IN THE FOUR SCHOOLS BY PROVIDING ABOUT THE SAME LEVEL OF GROWTH FOR EACH GRADE LEVEL AT EACH SCHOOL. THIS GROWTH WAS SO EXTENSIVE THAT ON THE PRE TEST SEVEN GRADE LEVEL GROUPS HAD TOTAL READING SCORES BELOW NORMS, BUT ON THE POST TEST ONLY ONE GRADE LEVEL GROUP WAS ACHIEVING BELOW ITS NORM. TOTAL READING PRE TEST SCORES FOR THE 17 GRADE LEVEL GROUPS WERE ABOUT TWO MONTHS ABOVE NORMS. EIGHT MONTHS LATER TOTAL READING SCORES FOR THE 17 GROUPS WERE ABOUT NINE MONTHS ABOVE NORMS.

Tables VIII, IX, and X display the individual achievement in Total Reading for each of the Atascadero target second and third graders. Each class is divided into two segments so it is possible to study those students who started below grade norms on the pre test and those who started at and above grade norms. The area between the pre and post test grade norms is shaded.

Generally, any student whose post test score falls within or beyond that shaded area will be able to read and process content area material independently in the next higher grade. It can be seen that only 14 of 92 (15%) of second graders and 26 of 156 (17%) of third graders had post test scores which did not reach the shaded area. These tables also show how well the above average readers are served in the Formula Phonics Reading Chain Program.

Table VIII—Second Grade—Two Schools
Individual Achievement in Total Reading

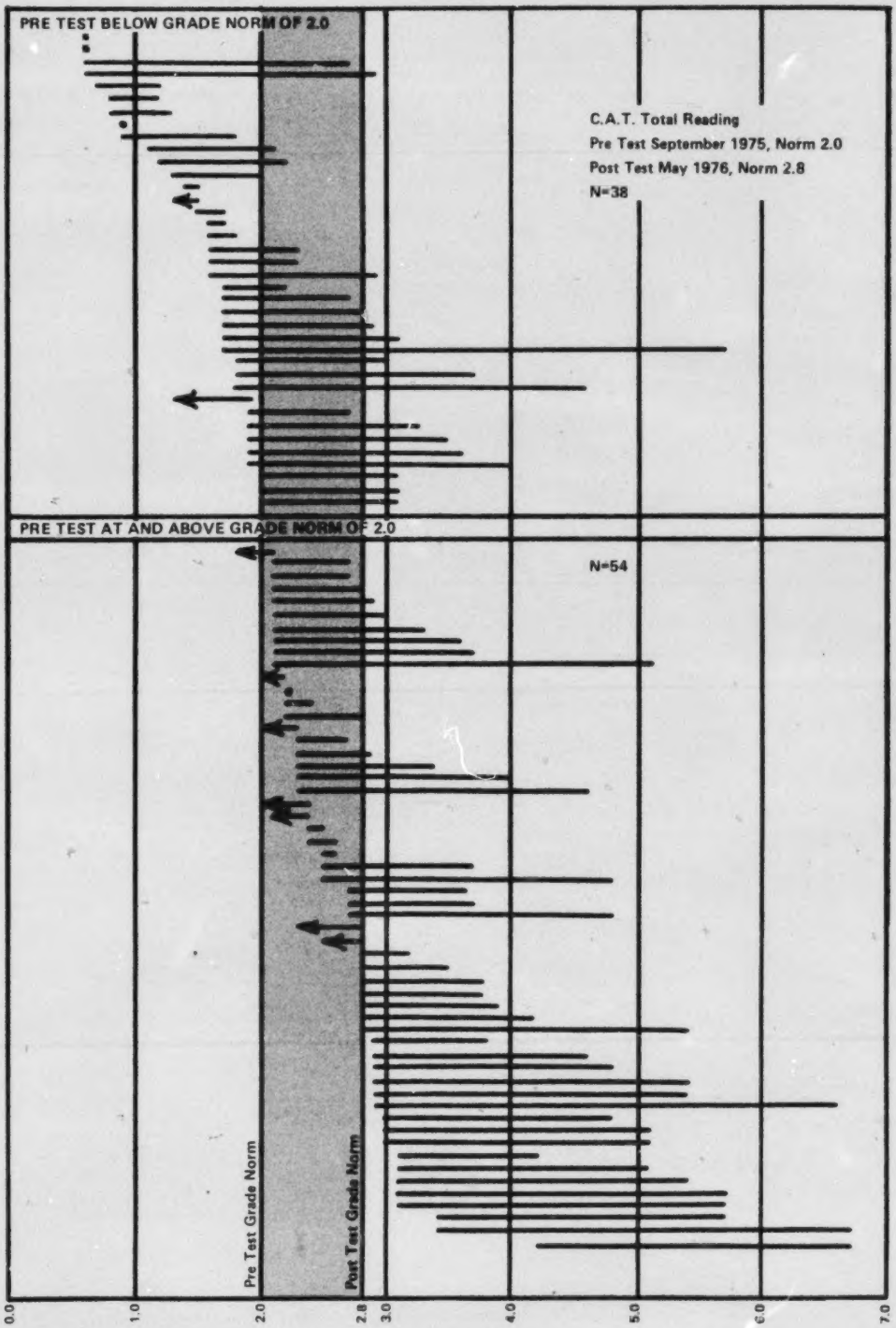


TABLE VIII SHOWS ACHIEVEMENT IN TOTAL READING FOR EVERY TARGET SECOND GRADER AT LEWIS AVENUE AND SANTA MARGARITA SCHOOLS. THESE ARE THE DISTRICT'S TWO TITLE I SCHOOLS. DURING THE EIGHT MONTHS BETWEEN THE TESTS IMPROVEMENT FOR THE 61 STUDENTS AT LEWIS AVENUE SCHOOL WAS 12 MONTHS (1.9 TO 3.1). FOR THE 31 STUDENTS AT SANTA MARGARITA SCHOOL IMPROVEMENT WAS 11 MONTHS (2.7 to 3.8).

Table IX—Third Grade—Three Schools
Individual Achievement in Total Reading
for Students Pre Testing Below Grade Norms

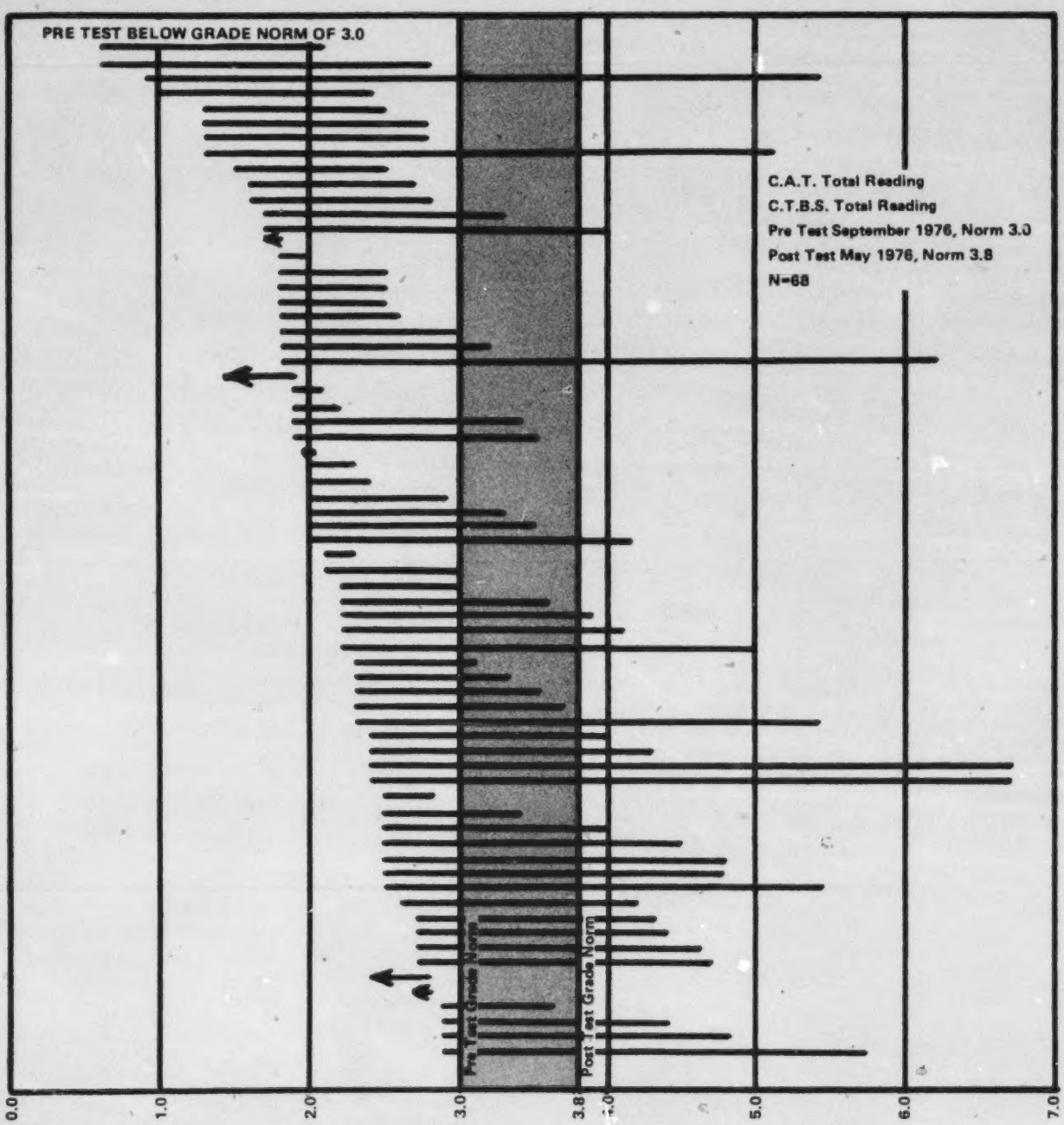


TABLE IX SHOWS ACHIEVEMENT IN TOTAL READING FOR EVERY TARGET THIRD GRADER WHO SCORED *BELOW* 3.0 ON THE PRE TEST AT LEWIS AVENUE, MONTEREY ROAD, AND SANTA MARGARITA SCHOOLS. DURING THE EIGHT MONTHS BETWEEN TESTS IMPROVEMENT FOR ALL OF THE 63 STUDENTS AT LEWIS AVENUE WAS 17 MONTHS (3.0 TO 4.7). FOR THE 64 STUDENTS AT MONTEREY ROAD IMPROVEMENT WAS 17 MONTHS (3.9 TO 5.6). FOR THE 29 STUDENTS AT SANTA MARGARITA IMPROVEMENT WAS 11 MONTHS (3.2 TO 4.3).

Table X—Third Grade—Three Schools
Individual Achievement in Total Reading
for Students Pre Testing at and Above Grade Norms

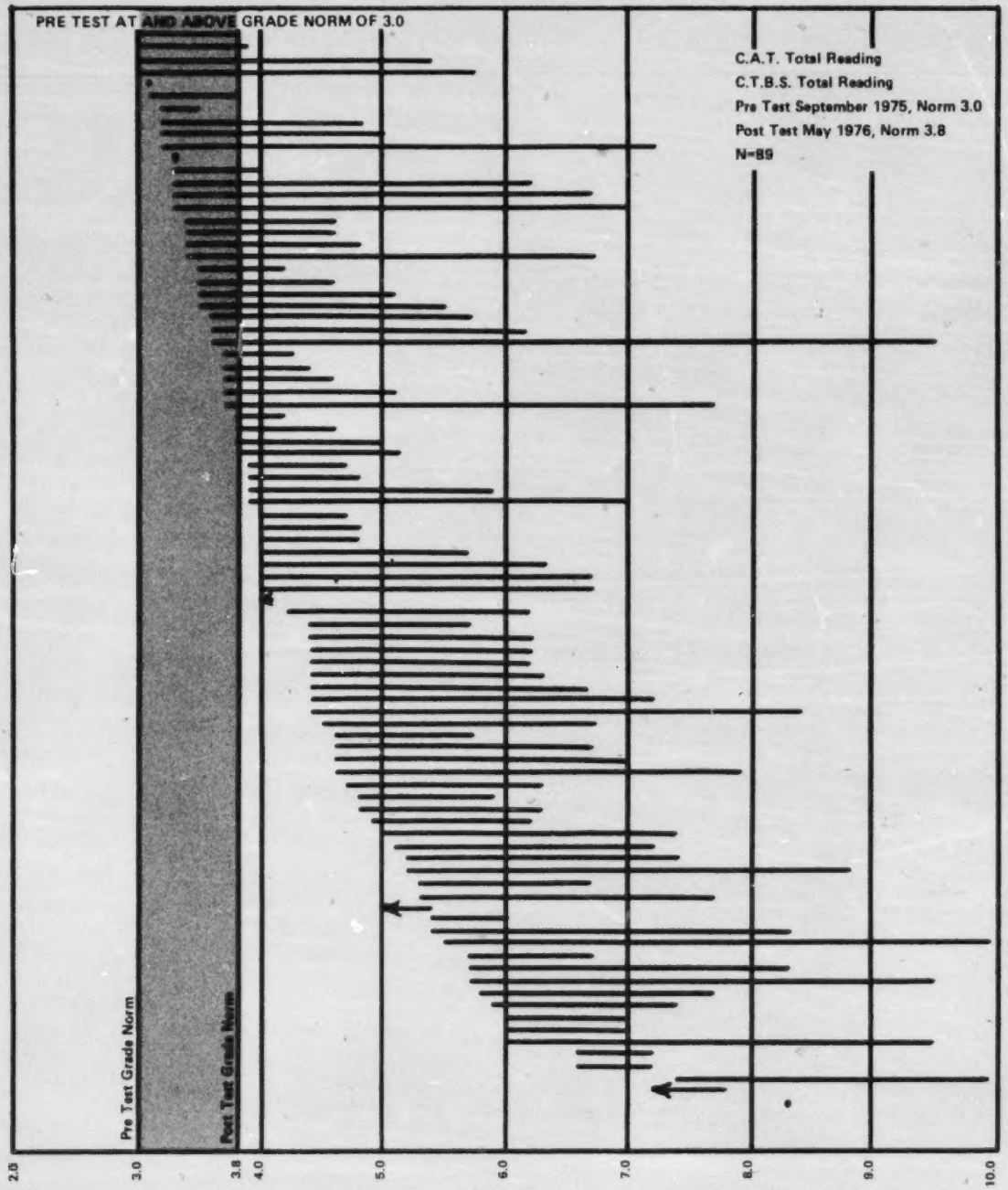


TABLE X SHOWS ACHIEVEMENT IN TOTAL READING FOR EVERY TARGET THIRD GRADER WHO SCORED *ABOVE* 3.0 ON THE PRE TEST AT LEWIS AVENUE, MONTEREY ROAD, AND SANTA MARGARITA SCHOOLS. THIS TABLE ILLUSTRATES HOW A SCHOOL'S HIGHEST ACHIEVING STUDENTS PROFIT FROM PLACEMENT IN A FORMULA PHONICS READING CHAIN PROGRAM. DATA SUCH AS THIS FROM ATASCADERO AND OTHER SCHOOL DISTRICTS IS BEGINNING TO SUGGEST THAT THERE IS APPARENTLY NO LIMIT TO THE DEVELOPMENT OF INTELLECTUAL GROWTH OF GIRLS AND BOYS TAUGHT IN READING CHAIN DIALOG GROUPS.

Budget Considerations

The *total* cost to the district for the Formula Phonics Reading Chain Program during the period between the pilot program in February, 1975, and the post test in May, 1976, was $13,944.00. This is equal to $3,486.00 per school. Of this sum of $13,944.00:

- $4,000.00 (or $1,000.00 per school) was a *capital outlay* for two 3/4" U-video cassette playback units and one 3/4" U-video playback-recording unit. In addition to their use in the four target schools, these three units are also bringing Formula Phonics programs to the district's two ranch elementary schools, the junior high school, the community-adult school, and the continuation high school.
- $6,819.20 (or $1,704.80 per school) was spent for such *non-consumable* items as two video cassette Formula Phonics programs, teaching manuals, and poster-wall charts for classrooms. The video programs and teaching manuals were used for program design in all of the elementary schools and were also used along with the teaching manuals to teach the system to virtually every elementary teacher and administrator, to district administrators, to substitute teachers, to aides, and to large numbers of parents. The video programs were also used to teach basic phonetic information to both elementary and secondary students.
- $3,124.80 (or $781.20 per school) was spent on *consumable* reading and spelling workbooks. This sum purchased enough workbooks to bring 1,359 elementary and secondary students into Reading Chain or conventional programs. The cost for reading and spelling workbooks for the 915 students in this study was $2,104.50 or $526.13 per school.

Since only existing staff was used to administer, coordinate, and teach in the program, there was no budget required for either certificated or classified salaries. Since all program design and staff development was accomplished by way of the teaching manuals and video programs, no monies had to be budgeted for consultation or staff development.

During school year 1976-1977 approximately 300 new students will enter the Reading Chain programs in the four schools. The *only* cost to bring these students into the program will be $690.00 for reading and spelling workbooks. The 915 students shown in this study will need no new Formula Phonics materials.

Summary

The Atascadero elementary schools were the first in California to employ a series of six new video productions in initial staff development and for the program design of their district-wide Formula Phonics Reading Chain Program. These video productions made it possible to replicate, in each of four very different schools, the exact program design found in the nationally honored Reading Chain program at Patterson Road School in Orcutt, California.[1]

After the first eight months of the program, district-wide test scores for target second through sixth graders show the same patterns of growth in reading skills found at Patterson Road and in schools in other districts with Reading Chains. In Atascadero, however, the rate of growth is about twice that found during the first year in earlier programs. Significantly, this pattern of growth is found both district-wide and in each individual school in Atascadero.

After the first eight months of the program the average improvement in Total Reading for 915 grade two through six target students was 16 months—two month's growth for each month's instruction. The program was found to be as effective in developing reading skills in the district's highest achieving readers as it was with its beginning and impoverished readers. Because it has been so effective with problem readers, it is likely that the program will generally eliminate reading disability in upper elementary and junior high school students over the next three years.

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[1] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, California. 1975. Available through ERIC Document Reproduction Service, ED 112-367.

The Formula Phonics Reading Chain Program at Mentone Elementary School Redlands, California Unified School District

School Year—1975-1976

Background

In June, 1976, the Formula Phonics Reading Chain Program at Mentone School completed its second year. This program follows very closely all Formula Phonics program design and staff development guidelines. Teaching, both in the Reading Chain Dialog Groups and in the classrooms, is at a very high level. Administration and program coordination, as well as district level support, are particularly strong. The school currently serves as a dissemination site for educators wishing to study or to establish Formula Phonics Reading Chain Programs.

In school year 1975-1976 staff at Mentone School voted to employ a staggered day reading schedule to insure that only one group of students at a time would be in classrooms during the Reading Chain period. Because of district bus schedules, the school has an articulated (Grades 2—6) Reading Chain in the morning for about half its students. Primary (Grades 2—3) and elementary (Grades 4—6) Reading Chains meet in the afternoon for the remaining children.

All of the school's students in grades K—3 participate in California's Early Childhood Education (E.C.E.) Program. Second and third graders participate in the actual Reading Chain program, while most of the Kindergarten and first graders participate in an intensive Formula Phonics readiness program. A few exceptional first graders are placed in the Reading Chain.

Learner Verification

Data from Mentone's program was first published in July, 1975, as a part of the dissemination-replication study of the nationally honored Formula Phonics Reading Chain Program at Patterson Road Elementary School in Orcutt, California.[1] That material is shown on the following page as Table I. Although the *Slosson Oral Reading Test* seems to yield rather high grade placement scores, the amount of growth seen at every grade level in the 1974-1975 study is significant.

During the program's second year, all second through sixth graders were again pre and post tested with the *Slosson Oral Reading Test*. These data are shown in Table II and, as in the first year's data, substantial growth in reading at each grade level is shown.

[1] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, California. 1975. Available through ERIC Document Reproduction Service, ED 112-367.

Table I

Learner Verification Study
Mentone School—Redlands Unified School District

Formula Phonics Reading Chain—First Year
Data of Study—July, 1975

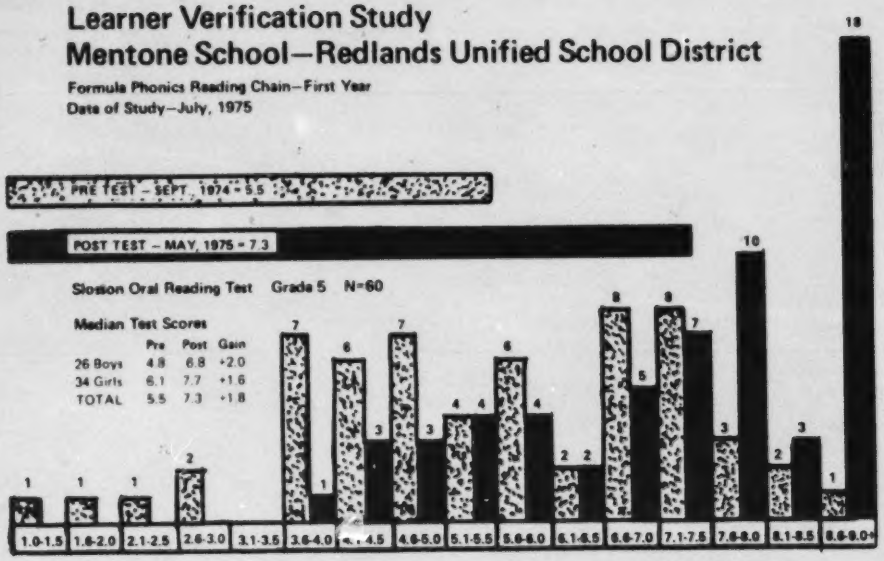
PRE TEST – SEPT., 1974 = 5.5

POST TEST – MAY, 1975 = 7.3

Slosson Oral Reading Test Grade 5 N=60

Median Test Scores

	Pre	Post	Gain
26 Boys	4.8	6.8	+2.0
34 Girls	6.1	7.7	+1.6
TOTAL	5.5	7.3	+1.8



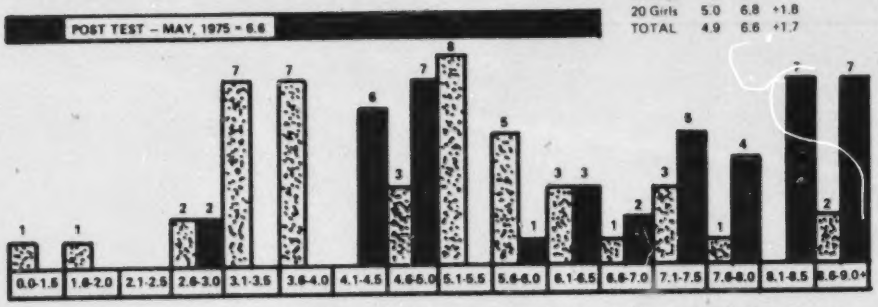
PRE TEST – SEPT., 1974 = 4.9

POST TEST – MAY, 1975 = 6.6

Slosson Oral Reading Test Grade 4 N=44

Median Test Scores

	Pre	Post	Gain
24 Boys	4.9	6.4	+1.5
20 Girls	5.0	6.8	+1.8
TOTAL	4.9	6.6	+1.7



During the 1974-75 school year 28 first graders were exposed to the Formula Phonics Reading System for periods ranging from two to seven months. They were neither placed in Reading Chain groups nor pre tested. When tested in May with the Slosson Oral Reading Test, scores ranged from 0.9 to 6.4 Mean—2.8; Mode—2.7; Median—3.0

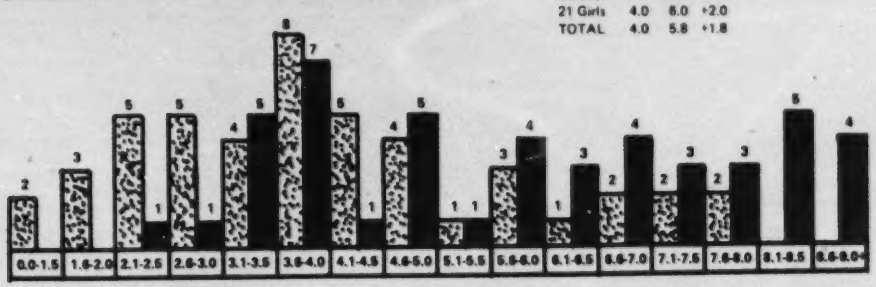
PRE TEST – SEPT., 1974 = 4.0

POST TEST – MAY, 1975 = 5.8

Slosson Oral Reading Test
Grade 3 N=47

Median Test Scores

	Pre	Post	Gain
26 Boys	4.1	5.7	+1.6
21 Girls	4.0	6.0	+2.0
TOTAL	4.0	5.8	+1.8



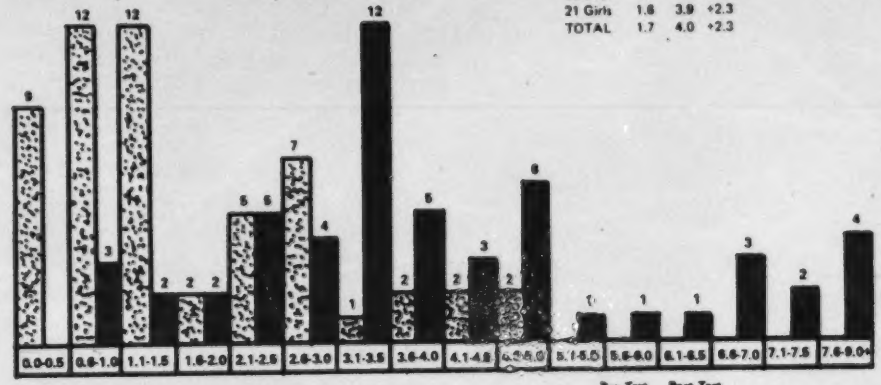
PRE TEST – SEPT., 1974 = 1.7

POST TEST – MAY, 1975 = 4.0

Slosson Oral Reading Test
Grade 2 N=54

Median Test Scores

	Pre	Post	Gain
33 Boys	1.7	4.1	+2.4
21 Girls	1.6	3.9	+2.3
TOTAL	1.7	4.0	+2.3



Summary
Second through sixth graders at Mentone School were pre tested in September, 1974, and post tested in May, 1975, with the Slosson Oral Reading Test. During that same period they were funded with phonetic decoding and spelling information with the video tapes and then were placed in Reading Chain Dialog Groups. Sixth graders were not post tested.

Grade	N=	Pre Test (Sept. 74)	Post Test (May, 75)	Gain
5	60	5.5	*7.3+	+1.8
4	44	4.9	*6.6+	+1.7
3	47	4.0	5.8	+1.8
2	54	1.7	4.0	+2.3

*12 fifth and 3 fourth graders scored at the high school level, 9.0+

Table II

Slosson Reading Scores—1975-1976

Grade	N=	Pre Test Grade Norm	Pre Test Mean Score	Post Test Grade Norm	Post Test Mean Score	Improvement In Months
1	42	1.0	N.A.	1.9	2.9	- - -
2	46	2.0	2.0	2.9	4.7	+27
3	60	3.0	3.5	3.9	5.2	+17
4	46	4.0	6.0	4.9	7.5	+15
5	42	5.0	6.4	5.9	8.2	+18
6	55	6.0	7.4	6.9	8.8	+14

Pre Test—September, 1975
Post Test—June, 1976
Period—9 Months

During the summer of 1976 it was decided to supplement the *Slosson* and to pre and post test primary youngsters with the *California Achievement Test (C.A.T.)* and upper elementary children with the *Comprehensive Test of Basic Skills (C.T.B.S.).*

There is now a substantial body of data to suggest that the program at Mentone School is producing the same patterns of student achievement as are seen in other Formula Phonics Reading Chain Programs. In these other programs it is seen that the effect of the program on student achievement is cumulative and it accelerates over time. Thus, as the programs mature, they produce student populations in which severe reading disability—students with grade equivalent reading scores on standardized tests which are two years or more below their grade norms—and mild reading disability—students with grade equivalent reading scores ten to nineteen months below their grade norms—are generally eliminated.

Because Mentone School serves many poor children and has a minority population of 23%, it was not expected that this pattern of achievement would emerge after only two years. However, post testing with the *Slosson* in June, 1976, disclosed that the process of generally eliminating reading disability is far advanced. Of 268 second through sixth graders who were tested at that time only 4 (1.5%) scored two years or more below grade norms. One student each in Grades 2, 3, 5, and 6, and none in Grade 4 scored two years or more below grade norms. Further, only 15 pupils (5.6%)—3 second graders, 4 third, 3 fourth, 2 fifth, and 3 sixth—scored ten to nineteen months below grade norms.

Another way to evaluate the cumulative effect of the Formula Phonics Reading Chain Program on the student population at Mentone School is to study the range of reading scores which are found in the reading-language processing groups. One of many factors used in determining initial group placement at Mentone School each October is a student's reading grade equivalent score on the *Slosson.* Table III shows how the range of these scores has changed from the program's first grouping in October, 1974, then at the beginning of the second year in October, 1975, and finally in October, 1976, as the program entered its third year.

Table III

Reading Chain Group Placements
Entry Test Ranges *(Slosson)*

Group	Oct. 1974	Oct. 1975	Oct. 1976
1	.1–1.0	.6–1.5	0–1.8
2	1.1–2.5	1.5–2.8	1.9–2.8
3	2.6–3.0	2.8–3.4	2.9–3.6
4	3.1–3.9	3.4–4.4	3.6–4.5
5	4.0–4.6	4.4–5.0	4.6–5.6
6	4.7–5.0	5.0–6.1	5.5–6.3
7	5.1–5.6	6.1–7.3	6.4–7.9
8	5.7–6.9	7.5–8.3	8.0–8.8
9	7.0–7.7	8.3–9.2	8.8–9.9
10	7.8–9.0		

Each year in April and in May the California State Department of Education provides for the testing of all of the state's second and third graders in reading, and for the sixth graders in the areas of reading, written expression, spelling, and mathematics. A matrix procedure is used in this testing so that every child takes some part of a test, yet no child takes the entire test. The data generated by this California Assessment Program (C.A.P.) is released to the public each November. These C.A.P. data are found beyond in Tables IV and V. These data are shown here to provide an external evaluation of the Formula Phonics program's impact on student achievement at Mentone School.

Table IV shows C.A.P. scores for Mentone's second, third, and sixth graders near the close of the program's first and second years.

Table IV

California Assessment Program Scores, 1975 and 1976

Grade 2	May, 1975	May, 1976	Difference
PERCENT OF CORRECT RESPONSES (READING)			
State Median School (Reading)	70.1	70.2	+0.1
Redlands District (Reading)	69.7	69.0	−0.7
Mentone School (Reading)	**62.8**	**73.8**	**+11.0**
STATE PERCENTILE RANKING AMONG ALL CALIFORNIA ELEMENTARY SCHOOLS			
Mentone School (Reading)	**28**	**62**	**+34**

Grade 3	May, 1975	May, 1976	Difference
PERCENT OF CORRECT RESPONSES (READING)			
State Median School (Reading)	84.5	84.4	−0.1
Redlands District (Reading	83.6	83.6	0.0
Mentone School (Reading)	**81.8**	**82.5**	**+0.7**
STATE PERCENTILE RANKING AMONG ALL CALIFORNIA ELEMENTARY SCHOOLS			
Mentone School (Reading)	**39**	**42**	**+3**

Grade 6	April, 1975	April, 1976	Difference
PERCENT OF CORRECT RESPONSES (READING)			
State Median School (Reading)	57.2	67.5	+10.3
Redlands District (Reading)	58.5	68.9	+10.4
Mentone School (Reading)	**55.7**	**73.5**	**+17.8**
STATE PERCENTILE RANKING AMONG ALL CALIFORNIA ELEMENTARY SCHOOLS			
Mentone (Reading)	**43**	**76**	**+33**
Mentone (Written Expression)	**18**	**74**	**+56**
Mentone (Spelling)	**87***	**75***	**−12***
Mentone (Mathematics)	**39**	**67**	**+28**

*In 1975, the percent of correct responses in Spelling was 58.7. In 1976 the percent of correct responses in Spelling was 67.9—a gain of +9.2.

THE CALIFORNIA ASSESSMENT PROGRAM DATA IN TABLE IV SHOWS THAT:

THE *SLOSSON* TEST DATA SHOWN IN TABLES I AND II ACCURATELY REFLECTS THE GROWTH IN READING ACHIEVEMENT IN THE SCHOOL'S STUDENTS. THE EFFECT OF THE PROGRAM ON STUDENT ACHIEVEMENT IS CUMULATIVE AND ACCELERATES OVER TIME.

THE PROGRAM'S READING-LANGUAGE PROCESSING STRATEGIES, WHICH ARE USED BOTH IN THE READING CHAIN GROUPS AND IN REGULAR CLASSROOMS, ALSO PRODUCE SIGNIFICANT GROWTH IN STUDENT ACHIEVEMENT IN THE CONTENT AREAS OF WRITTEN EXPRESSION, SPELLING, AND MATHEMATICS.

In each of the four test areas, Mentone's sixth graders had a higher percentage of correct scores than did sixth graders in the median school in the state. They also exceeded the district average of correct responses on each of the four tests.

In September, 1976, the Redlands Unified School District prepared an exhibit for presentation before the California State Assembly Committee on Education. That body met to hear testimony "to determine the overall trend of pupil achievement scores in California's elementary and secondary schools during the last five years and specific trends in selected school districts." During the hearing the Redlands' data was used to "validate the thesis that modifying in-school factors is more important than is modifying societal factors when it comes to raising achievement scores."[2] Material from the Redlands' exhibit is shown in Table V.

Table V ranks the district's thirteen elementary schools according to the percentage of correct scores recorded by sixth graders on the C.A.P. Reading test in April 1974, April 1975, and April 1976. Each school's state percentile ranking of Aid For Dependent Children (A.F.D.C.) families for 1975-1976 is shown in Column One. Column Two shows the numerical ranking of the thirteen district schools in April 1974, before the Formula Phonics program at Mentone School began.

In September, 1974, in addition to Mentone, the district's highest ranked school, shown as School "A" also started a Formula Phonics program. However, most teachers at that school only use the system's basic reading strategies instead of the complete galaxy of language processing procedures. Further, the school does not follow the Formula Phonics Reading Chain guidelines. It may be seen that two years later, in April 1976, sixth graders at School "A" scored substantially higher than did their counterparts two years before (78.5 in 1976 to 66.2 in 1974). However, the difference between those scores for School "A" and those for sixth graders at Mentone School has been reduced from 12.2 to 5.0. This is particularly important when the state A.F.D.C. percentile ranking for the two schools is compared.

[2]Testimony of Edward Vail before the California State Assembly Committee on Education, October 7, 1976, San Diego, California. Leroy F. Greene, Chairman.

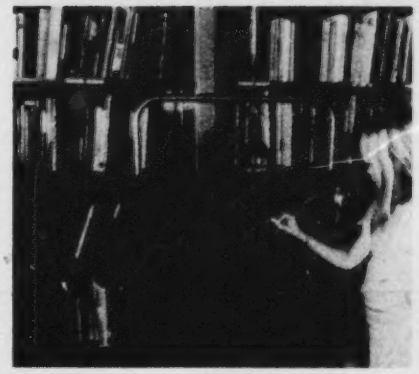


Table V

Ranking of Redlands Elementary Scores According to Percent of Correct Scores on The California Assessment Program Reading Test

School	April, 1976 A.F.D.C. Percentile	April, 1974 Rank Pre-Program		April, 1975 Rank First Year		April, 1976 Rank Second Year	
District Median			*59.4*		*58 5*		*68.9*
A	36%	1st	*66.2*	6th	*59.9*	2nd	*78.5*
B	53%	2nd		2nd		4th	
C	44%	3rd		3rd		7th	
D	29%	4th		4th		3rd	
E	81%	5th		13th		9th	
F	46%	6th		5th		5th	
G	67%	7th		8th		8th	
H	35%	8th		1st		1st	
I	67%	9th		10th		11th	
J	56%	10th		7th		10th	
K	83%	11th		12th		12th	
Mentone	**61%**	**12th**	*54.0*	**9th**	*55.7*	**6th**	*73.5*
M	83%	13th		11th		13th	

IN TWO YEARS, SCORES FOR SIXTH GRADERS AT MENTONE SCHOOL SHIFTED FROM 5.4% OF CORRECT SCORES IN READING *BELOW* THE DISTRICT MEDIAN TO 4.6% *ABOVE*—AN IMPROVEMENT OF 10 CORRECT ANSWERS. IT SHOULD BE NOTED THAT SIXTH GRADERS TESTED IN APRIL, 1975, HAD BEEN IN THE FORMULA PHONICS READING CHAIN PROGRAM SEVEN MONTHS. SIXTH GRADERS TESTED IN APRIL, 1976, HAD BEEN IN THE PROGRAM 16 MONTHS.

Budget Considerations

The video programs which are used for program design, staff development, and standardizing phonetic information for all students in Formula Phonics Reading Chain Programs were purchased by the Redlands Unified School District for use in district schools and programs. In addition to their use at Mentone School, the video programs are used also at Victoria School, which started its Reading Chain in October, 1976, School "A", and in the district bilingual program. Thus, the individual schools have to purchase only Formula Phonics teaching manuals, student books, and wall charts during the program's first year and only workbooks for new students thereafter. This in turn frees budget after the first year for the purchase of collegiate level dictionaries, reference works, and sets of paperback books which are read and processed in the Reading Chain groups and in the classrooms.

At a school the size of Mentone School, when the district buys the video tapes, first year Reading Chain start-up costs to supply staff with teaching manuals, rooms with wall charts, and second through sixth graders with both reading and spelling workbooks come to approximately $1025.00. During the second and third years of the program, only student workbooks for second graders and new students need be purchased. The cost to add 75 such students to a Reading Chain program is $176.50 per year or a total of $353.00 for two years. Thus, the total three-year cost for a school similar in size to Mentone—with the district buying the video programs—is $1378.00. This averages about $460.00 per year.

Summary

Mentone School's student body is 23% minority (22% Spanish surnamed). Its socio-economic index is below 76% of the schools in California and its percent of bilingual students exceeds that of 71% of the schools. Thus, a significant number of the children at Mentone School are poor and many come from homes which are linguistically and culturally different.

Throughout the English speaking world, the professional literature is insistent that there exists an extremely high correlation between social class, ethnicity, and language background on one hand and achievement in reading on the other. Hence, one might predict with considerable assurance that the students at Mentone School would have reading scores significantly below their grade norms.

But the children at every grade level at Mentone School have average reading achievement scores significantly *above* grade norms. Sixth graders, for instance, scored nineteen months higher than their 6.9 grade norm. These same students had a higher percent of correct scores in *each* of the four areas tested in the California Assessment Program than did the median school in either the state of California or the Redlands School District. In June, 1976, Mentone Elementary School graduated a class of sixth graders whose:

- Reading scores ranked above 76%
- Written Expression scores ranked above 74%
- Spelling scores ranked above 75%
- Mathematics scores ranked above 67%

of the other elementary schools in California.

Equally impressive is the fact that at Mentone School the Formula Phonics Reading Chain Program has generally eliminated reading retardation in students at every grade level. Only 1.5% of *all* second through sixth graders (4 of 268) are severely retarded in reading and tested two years or more below their grade norms. Only 5.6% of those students (15 of 268) are mildly retarded in reading and tested between ten and nineteen months below their grade norms.

Impressive as these figures are, however, it should be noted that they were achieved during an early stage of the program. The current third graders, for instance, whose percent of correct reading scores in the California Assessment Program is already higher than the state median school, will be in Reading Chain Dialog Groups for three more years before they graduate in June, 1980!

Mentone Elementary School Profile

Mentone is a rural community with an unincorporated population of about 3500. The ethnic make-up is primarily Anglo with about 23% Mexican-American, Indian, and Oriental. The prominent language is English with an insignificant number of non-English speaking persons.

The economic level is classified as low-middle income with approximately 95% of the employed parents in non-professional positions. One-third of the Mentone School families have both parents working, with a large majority of these families being employed outside of the community. Another one-third of the families are single parents.

Other pertinent factors are: (1) 12% of the school children are recipients of A.F.D.C.; (2) 33% of the children are recipients of free or reduced lunches; (3) the school population has a 22% mobility factor; (4) school enrollment is 355, with 194 coming by bus.

Mentone is a small community adjoining Redlands to the north and its commercial center is situated approximately 3 miles from the center of Redlands. A number of small business establishments (beauty parlor, hardware store, eating facilities, garages, etc.) are in Mentone. However, with the exception of Mentone School, a small U.S. Post Office and a bus system, no "community services" are available within Mentone. Persons must travel to Redlands or elsewhere for services related to health and welfare, recreation, counseling, commercial or cultural activities. Historically, community residents have felt unrecognized by Redlands citizens.

Teachers have observed that at least 15% of the school population have some degree of emotional difficulties. A majority of the children entering Kindergarten are not "typically" ready for entrance in a Kindergarten program due to cultural practices, the low level of income and lack of recreational and educational experiences within Mentone.

—Report to the California State Department of Education, 1976

Ethnic Distribution—June, 1976

White/Not Spanish Surnamed 273 (77%); Spanish Surnamed 78 (22%); Other 4 (1%). Total enrollment 355. Combined minority students 82 (23%).

S.E.S. Data from March, 1976, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 24
Parent Bilingual—
State Percentile Rank 71
Percent A.F.D.C.
State Percentile Rank 60
Pupil Mobility
State Percentile Rank 17

Reading Test Results from 1975-1976 California Assessment Program Report

(After two years of the Formula Phonics Reading Chain Program)
Grade 2—State Percentile Rank 62
Grade 3—State Percentile Rank 42
Grade 6—State Percentile Rank 76

Spelling

Grade 6—State Percentile Rank 75

Funding

Only district and State General Funds have been used for Formula Phonics materials. The school does have an Early Childhood Education program for Grades K—3.

Initial Reading Program in Grades K—1

Bannantyne, Lippincott, and *Formula Phonics*

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The Formula Phonics Reading Chain Program at Roosevelt Elementary School, Santa Barbara, California

School Year 1975-1976

The School

Roosevelt Elementary School has a Grade 3-6 population. It is paired with another school as part of the Santa Barbara School District's integration project. Roosevelt's K-2 students are bused out to the paired school, Lincoln Elementary. The students who are bused into Roosevelt represent between 40 to 45 percent of the total student body and provide a most diverse ethnic and social class mix. Achievement levels for students vary widely. Entering students from low S.E.S. (Social-Economic Status) backgrounds generally achieve markedly below grade norms and students from the higher S.E.S. backgrounds achieve above. A prime goal of the Formula Phonics Reading Chain Program at Roosevelt School is to provide parity in educational outcome for the low S.E.S. children while at the same time increasing educational achievement for the high S.E.S. children.

The Program

The Formula Phonics Reading Chain Program at Roosevelt School is two years old. The Reading Chain is segmented into a Grade 3-4 segment and a Grade 5-6 segment. However, all teachers rotate through all of the groups in both segments of the Reading Chain except for two groups. These are: (1) a stationary group where the least effective third graders remain during the first year or until they are ready for placement in one of the beginning reading groups; and (2) a group composed of non and near non-English speaking students. These students participate in the Formula Phonics English as a Second Language Program so that when they move into the Reading Chain groups, they can speak and understand English and also are well on the way to reading, spelling, and writing it.

The program at Roosevelt School is a textbook example of what a Formula Phonics Reading Chain should be. Program design, administration, classroom and Reading Chain teaching, and student achievement are at the highest level; and the school was a program dissemination site during the 1975-1976 school year. It is interesting to note that the *total* cost of the program for two years has been less than the cost of hiring a single full time aide for one school year.

Learner Verification

Achievement testing in the Santa Barbara School District is with the *Metropolitan Achievement Tests.* Generally, students are pre tested in late September and post tested in early May. All data in this study was supplied by the school and was taken from the printouts. All demographic information in this study was also provided by the school.

A problem with the *Metropolitan Achievement Tests* concerns their norms. The norms are much too low to show either level of reading and language achievement or amount of growth in the upper elementary population who participated in the Formula Phonics Reading Chain Program. The highest attainable grade equivalent score on the reading test and the language test is 9.8. This proved to be far too low to test many of these children who are spending 45 minutes every day in a Reading Chain Dialog Group reading, discussing, and otherwise processing high school and adult level material.

An examination of the data (see Table IV and VI) shows that when they were post tested with the Intermediate Form of the *Metropolitan Achievement Test,* 26 of 73 students in the sixth grade (36%) and 11 of 58 students in the fifth grade (19%)—who had been in the program for two years—had perfect scores of 9.8 on Reading Comprehension. Thus, 37 of the 131 fifth and sixth graders (28%) achieved perfect scores on that test; and, as a result, the mode for both classes is 9.8.

In addition to the 26 target sixth graders who had perfect Reading Comprehension scores of 9.8, eight other sixth graders who had been in the program less than two years also had perfect scores. Hence, on the first day of May, 1976, of the 96 sixth graders at Roosevelt School, 34 (35%) had perfect scores of 9.8 in Reading Comprehension.

Table I treats with those 285 students who were both pre and post tested during school year 1975-1976. As with virtually every Formula Phonics Reading Chain population these students had higher scores in Reading Comprehension than in Reading Vocabulary. Improvement is found across all ability groups, and upper elementary students show the same gradient of growth in reading as do primary students. The exceptionally high growth in language may be attributed to the fact that during the past year most of the teachers were able to shift their emphasis from teaching basic reading skills and vocabulary development to teaching high level language processing of their curriculum.

Table I—Total School
School Year 1975-1976

N =	Word Knowledge			Reading Comprehension			Total Reading			Language		
	Pre	Post	Imp.	Pre	Post	Imp.	Pre	Post	Imp.	Pre	Post	Imp.
Third Grade[1]												
76	3.4	4.3	+0.9	3.2	4.5	+1.3	3.3	4.3	+1.0	N.A.	N.A.	N.A.
Fourth Grade[2]												
59	4.1	5.2	+1.1	3.9	5.0	+1.2	4.0	5.1	+1.1	3.8	5.5	+1.7
Fifth Grade[3]												
66	5.7	6.2	+0.5	5.6	6.5	+0.9	5.6	6.3	+0.7	5.1	6.5	+1.4
Sixth Grade[4]												
84	6.2	6.9	+0.7	6.2	7.3	+1.1	6.2	7.3	+1.1	6.0	7.4	+1.4
Reading—Grades Three Through Six[5]												
285			+0.8			+1.1			+1.0			
Language—Grades Four Through Six[5]												
209												+1.5

[1]Pre Test, *M.A.T., Prim. II, Form F*—10/1/75 (Norm 3.1): Post Test, *M.A.T., Elem. Form G*—5/1/76 (Norm 3.8)
Number of perfect 9.8 scores on Post Test: W K, 2; R C, 0; T R, 0.

[2]Pre-Test, *M.A.T., Elem., Form F*—10/1/75 (Norm 4.1): Post Test, *M.A.T. Elem., Form G*— 5/1/76 (Norm 4.8)
Number of perfect 9.8 scores on Post Test: W K, 4; R C, 0; T R, 2; LANG, 2.

[3]Pre Test, *M.A.T., Inter., Form F*—10/1/75 (Norm 5.1): Post Test, *M.A.T., Inter., Form G*—5/1/76 (Norm 5.8)
Number of perfect 9.8 scores on Post Test: W K, 5; R C, 10; T R, 7; LANG, 3.

[4]Pre Test, *M.A.T., Inter., Form F*—10/1/75 (Norm 6.1): Post Test, *M.A.T., Inter., Form G*—5/1/76 (Norm 6.8)
Number of perfect 9.8 scores on Post Test: W K, 12; R C, 29; T R, 19; LANG, 19.

[5]Number of perfect 9.8 scores on Post Test: W K, 23; R C, 39; T R, 28; LANG, 24.

The tables which follow treat with the three student populations which have been in the program over the two years of its existence at Roosevelt School—the school's fourth, fifth, and sixth graders. Only those students for whom there are both pre and post test scores are included. All students were pre tested on September 27, 1974 and post tested on May 1, 1976—a period of 17 teaching months. In these tables pre test data is presented in dotted columns [redacted] and post test data is presented in solid columns [redacted]. There are two tables for fourth and fifth graders and there are three tables for sixth graders.

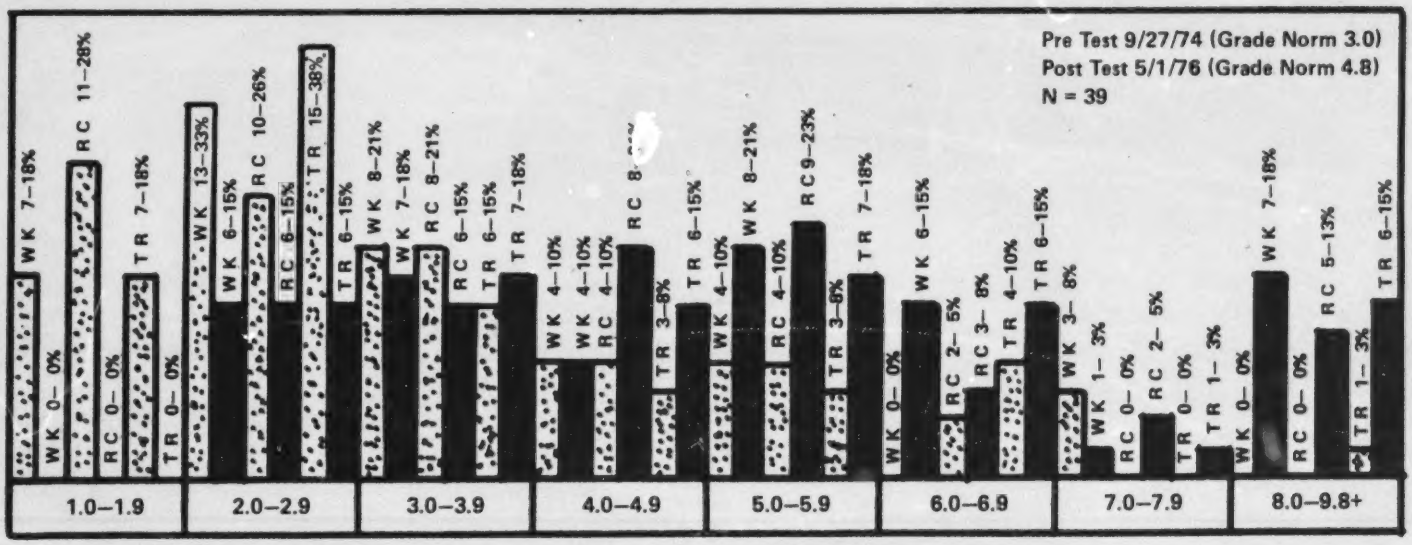
The first table in each set shows distribution of pre and post test scores in Work Knowledge (W K), Reading Comprehension (R C), and Total Reading (T R). These three tables present a graphic description of student growth in reading ability over the period of the study. By studying the post test (solid columns) scores, it is possible to see why at Roosevelt School almost all content area teaching in the homerooms is from grade level, or higher, textbooks. Of course, only when all students have equal access to information in the *same* textbooks is it possible to provide educational parity for them all.

The second set of tables is designed to show how well the Formula Phonics Reading Chain Program serves students of varying ability levels. To do this the pre test scores for all students who scored within a certain range (i.e., 2.0 to 2.9 or 6.0 to 6.9) were averaged and then plotted. Next, the post test scores for those *same* students were averaged and plotted directly below the pre test column. Even a cursory examination of these three tables shows the remarkable growth which even the poorest groups of readers made during the course of the program.

FOURTH GRADE STUDY

The 39 fourth graders in this study were pre tested as third graders in the fall of 1974 with the Primary II, Form F of the *Metropolitan Achievement Test* and post tested in the spring of 1976 with the Elementary, Form G. Pre test grade norm was 3.0 and the post test grade norm was 4.8. On the pre test 22 students (56%) tested one month or more below grade norm. On the post test 18 students (46%) tested one month or more below grade norm.

Table II—Fourth Grade
Distribution of Reading Scores



W K = Word Knowledge R C = Reading Comprehension T R = Total Reading

TABLE II SHOWS THE DISTRIBUTION OF PRE AND POST TEST READING SCORES FOR 39 FOURTH GRADERS.

Table III—Fourth Grade
Total Reading Outcome by Ability Groups

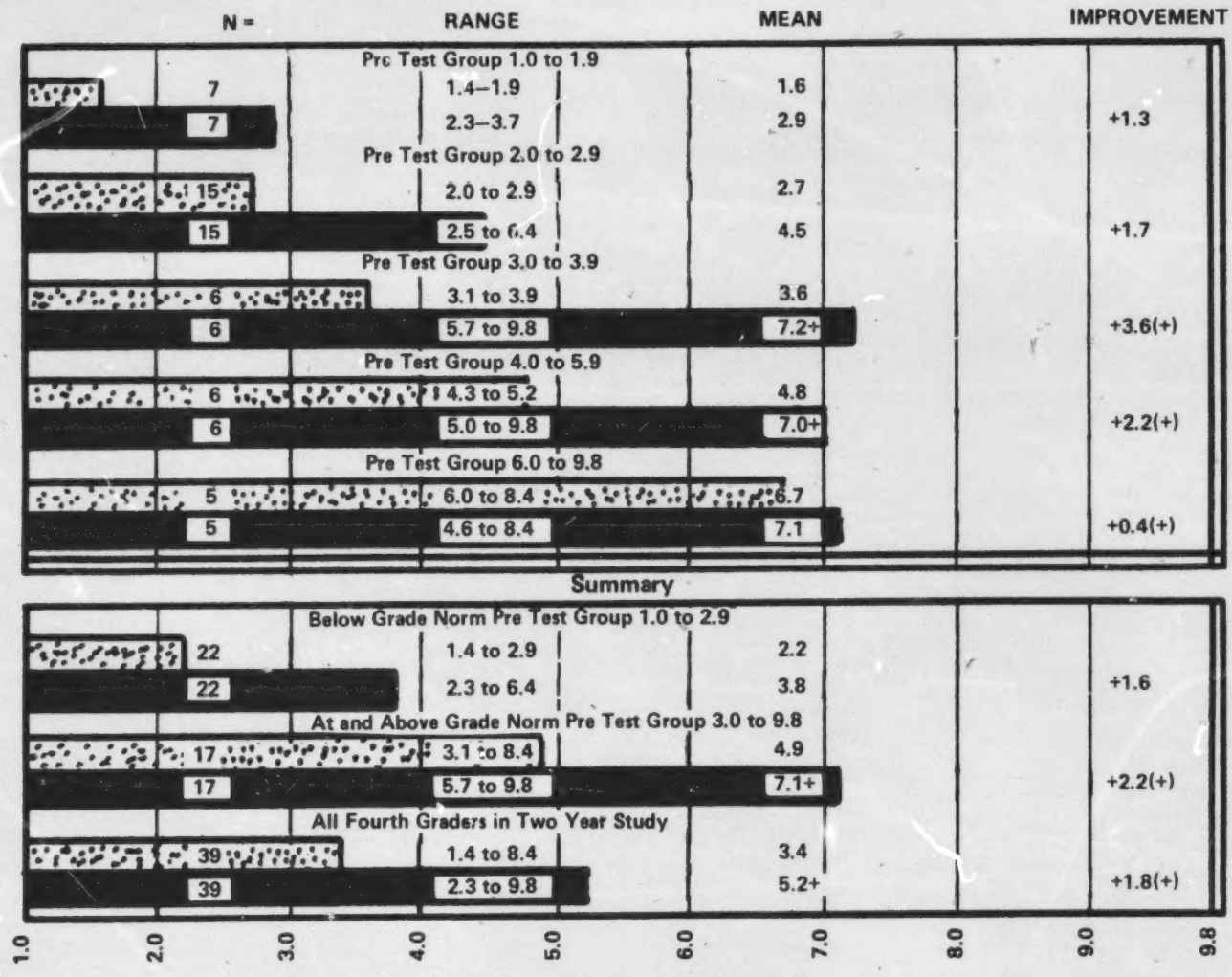


TABLE III SHOWS PRE AND POST TEST TOTAL READING SCORES FOR THE *SAME* STUDENTS IN EACH GROUP.

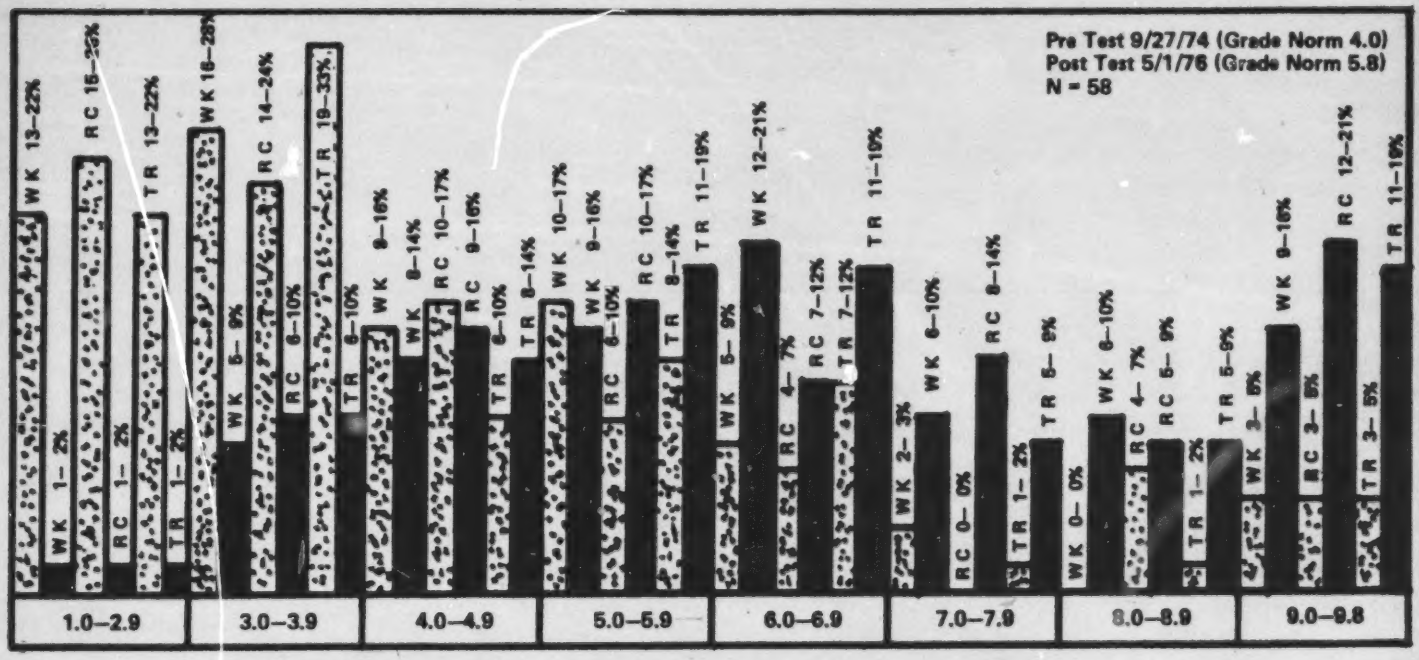
A summary of pre and post test Total Reading scores for the 39 students in the fourth grade study follows:

PRE TEST—SEPTEMBER 27, 1974—GRADE NORM 3.0
MEAN 3.4; *MODE* SCATTERED 1.5, 2.6-2.7, 3.9, 5.2, 6.0; *MEDIAN* 2.8
POST TEST—MAY 1, 1976—GRADE NORM 4.8
MEAN 5.3; *MODE* SCATTERED 3.5, 6.4, 8.4; *MEDIAN* 4.9

FIFTH GRADE STUDY

The 58 fifth graders in this study were pre tested as fourth graders in the fall of 1974 with the Elementary, Form F of the *Metropolitan Achievement Test* and post tested in the spring of 1976 with the Elementary, Form G. Pre test grade norm was 4.0 and the post test grade norm was 5.8. On the pre test 32 students (55%) tested one month or more below grade norm. On the post test 22 students (38%) tested one month or more below grade norm.

Table IV—Fifth Grade
Distribution of Reading Scores



W K = Word Knowledge R C = Reading Comprehension T R = Total Reading

TABLE IV SHOWS THE DISTRIBUTION OF PRE AND POST TEST READING SCORES FOR 58 FIFTH GRADERS. NOTE THAT ON THE POST TEST ONLY 7 STUDENTS HAVE TOTAL READING SCORES BELOW THE LITERACY LEVEL OF 4.0.

Table V—Fifth Grade
Total Reading Outcome by Ability Groups

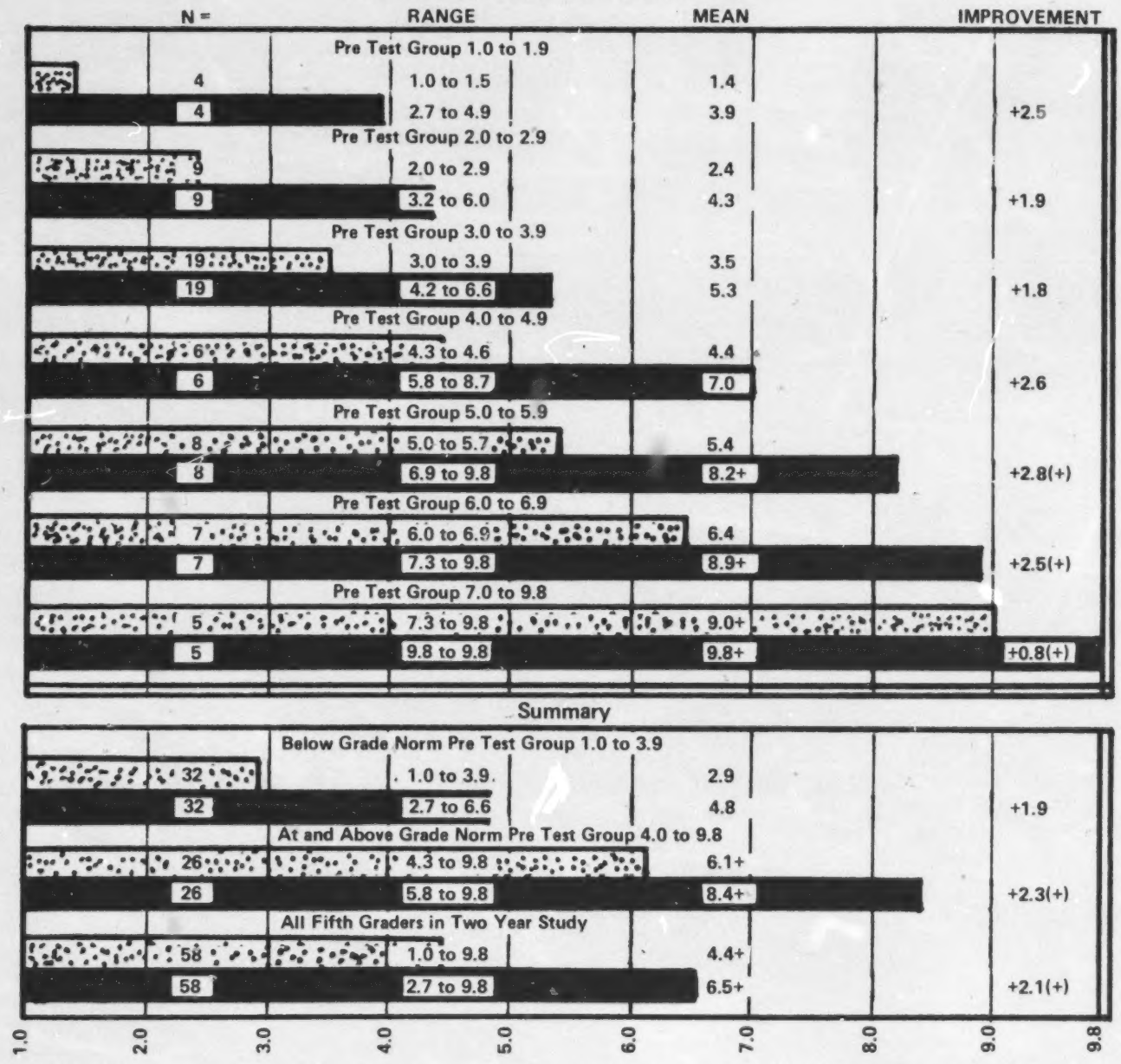


TABLE V SHOWS PRE AND POST TEST TOTAL READING SCORES FOR THE *SAME* STUDENTS IN EACH GROUP. NOTE THE EXCEPTIONAL GROWTH IN STUDENTS READING AT OR ABOVE GRADE NORMS ON THE PRE TEST. NOTE, ALSO, THAT ON THE POST TEST THERE WERE PERFECT SCORES IN EACH OF THE THREE TOP GROUPS, WITH *EVERY* STUDENT IN THE TOP GROUP SCORING 9.8.

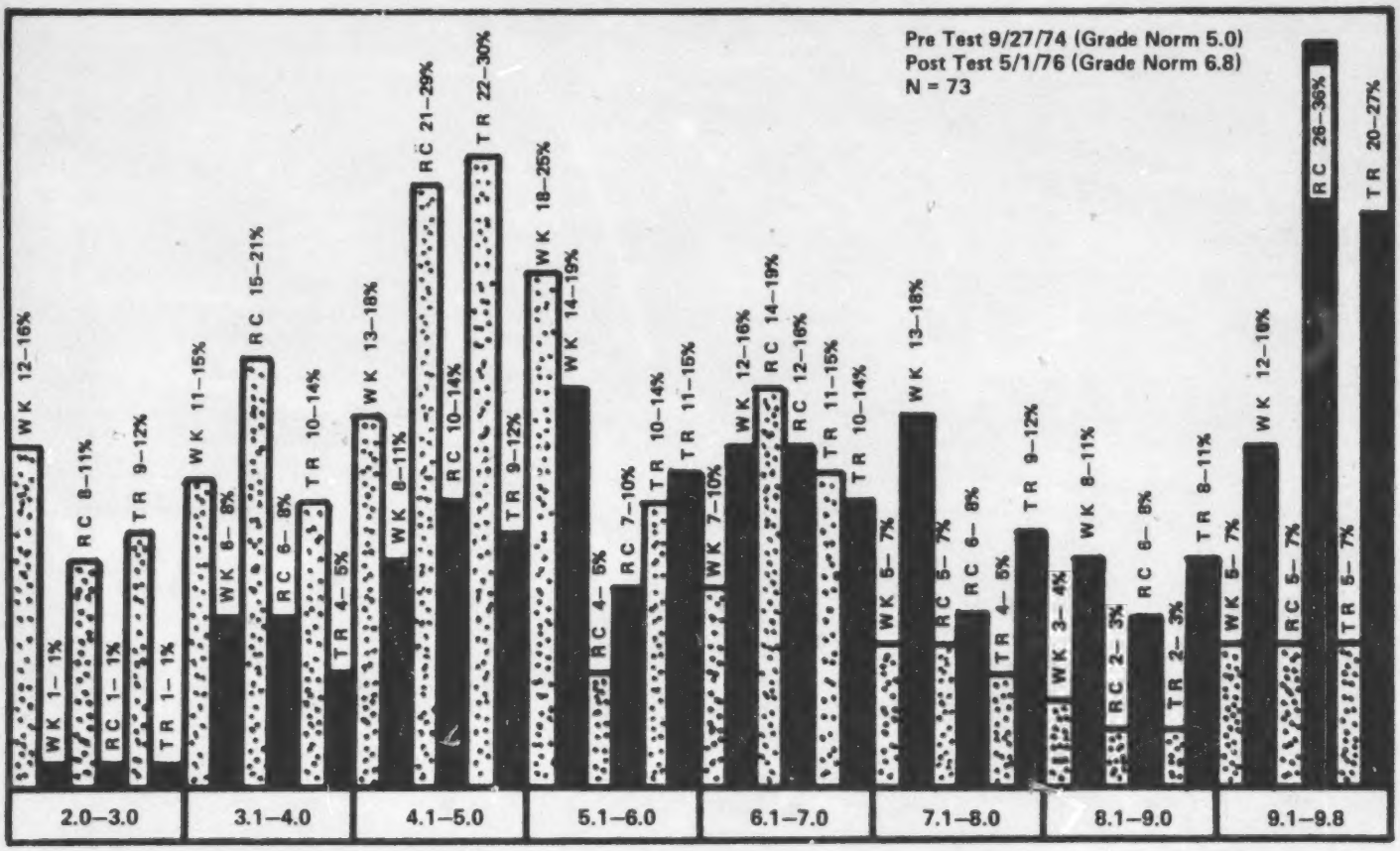
A summary of pre and post test Total Reading scores for the 58 students in the fifth grade study follows:

PRE TEST–SEPTEMBER 27, 1974–GRADE NORM 4.0
MEAN 4.4; *MODE* 3.3; *MEDIAN* 3.8
POST TEST–MAY 1, 1976–GRADE NORM 5.8
MEAN 6.5; *MODE* 9.8; *MEDIAN* 6.0

SIXTH GRADE STUDY

The 73 sixth graders in this study were pre tested as fifth graders in the fall of 1974 with the Intermediate, Form F of the *Metropolitan Achievement Test* and post tested in the spring of 1976 with the Intermediate, Form G. Pre test grade norm was 5.0 and the post test grade norm was 6.8. On the pre test 38 students (52%) tested one month or more below grade norm. On the post test 33 students (45%) tested one month or more below grade level.

Table VI—Sixth Grade
Distribution of Reading Scores



W K = Word Knowledge R C = Reading Comprehension T R = Total Reading

TABLE VI SHOWS THE DISTRIBUTION OF PRE AND POST TEST READING SCORES FOR 73 SIXTH GRADERS. NOTE THAT ON THE POST TEST 26 STUDENTS HAD PERFECT 9.8 SCORES IN READING COMPREHENSION. 20 STUDENTS HAD PERFECT SCORES IN TOTAL READING. EQUALLY SIGNIFICANT, ONLY 5 STUDENTS HAD POST TEST TOTAL READING SCORES BELOW THE FOURTH GRADE LEVEL OF LITERACY. THERE WERE ONE 3.8, TWO 3.7's, ONE 2.6, AND ONE 2.7.

Table VII—Sixth Grade
Total Reading Outcome by Ability Groups

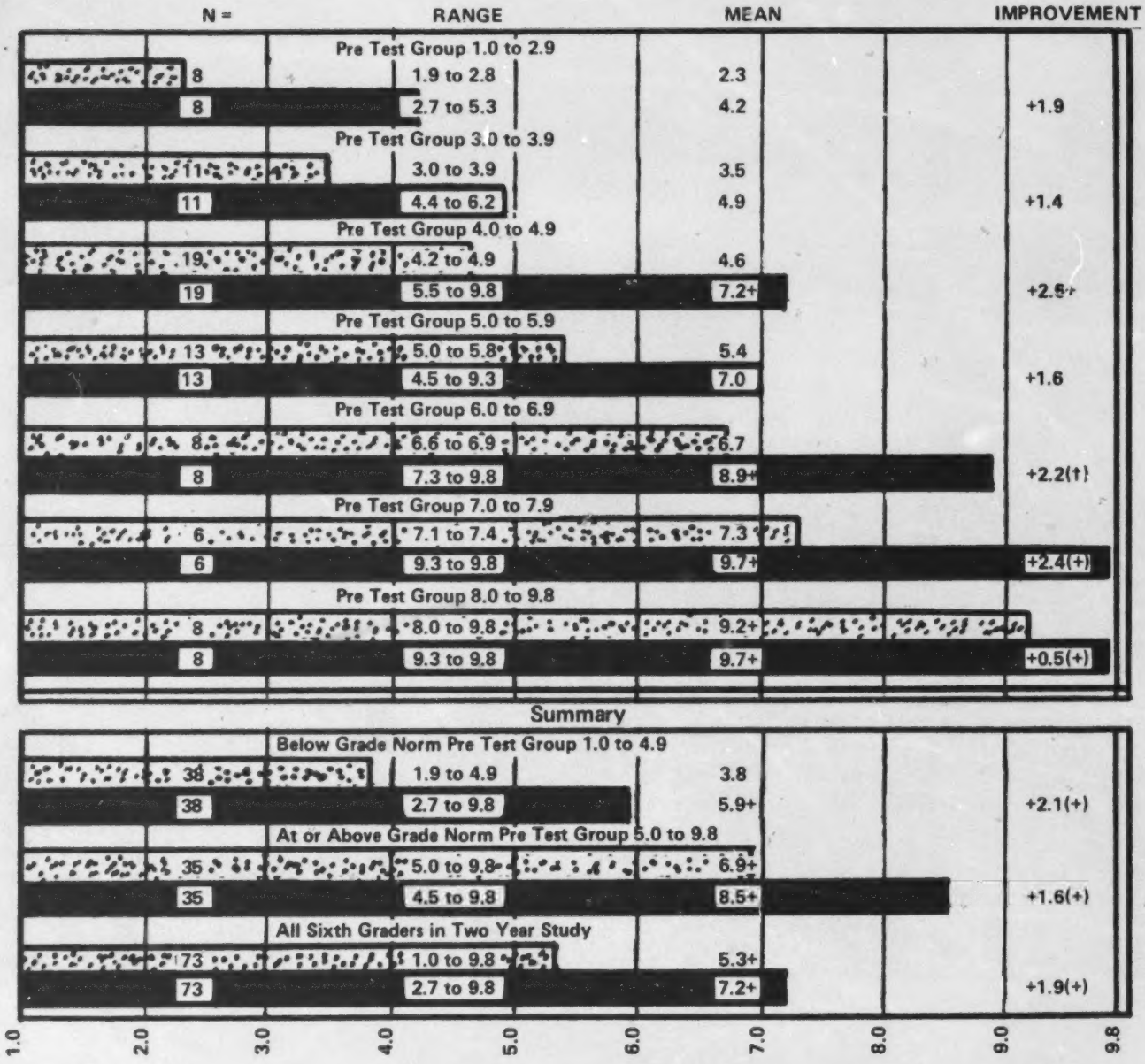


TABLE VII SHOWS PRE AND POST TEST TOTAL READING SCORES FOR THE *SAME* STUDENTS IN EACH GROUP. NOTE HOW THE 9.8 MAXIMUM GRADE NORM ON THE *M.A.T.* PREVENTS AN ADEQUATE ASSESSMENT OF EITHER GROWTH IN READING OR TRUE LEVEL OF READING ABILITY.

A summary of pre and post test Total Reading scores for the 73 students in the sixth grade study follows:

PRE TEST–SEPTEMBER 27, 1974–GRADE NORM 5.0
MEAN 5.3; *MODE* 4.9; *MEDIAN* 4.9
POST TEST–MAY 1, 1976–GRADE NORM 6.8
MEAN 7.2; *MODE* 9.8; *MEDIAN* 7.3

Because of the interest educators have in examining exit level skills in student populations, an additional table is presented in this sixth grade study. Table VIII permits the reader to view individual achievement in Reading Comprehension for each of the 73 sixth graders.

Table VIII—Sixth Grade
Reading Comprehension

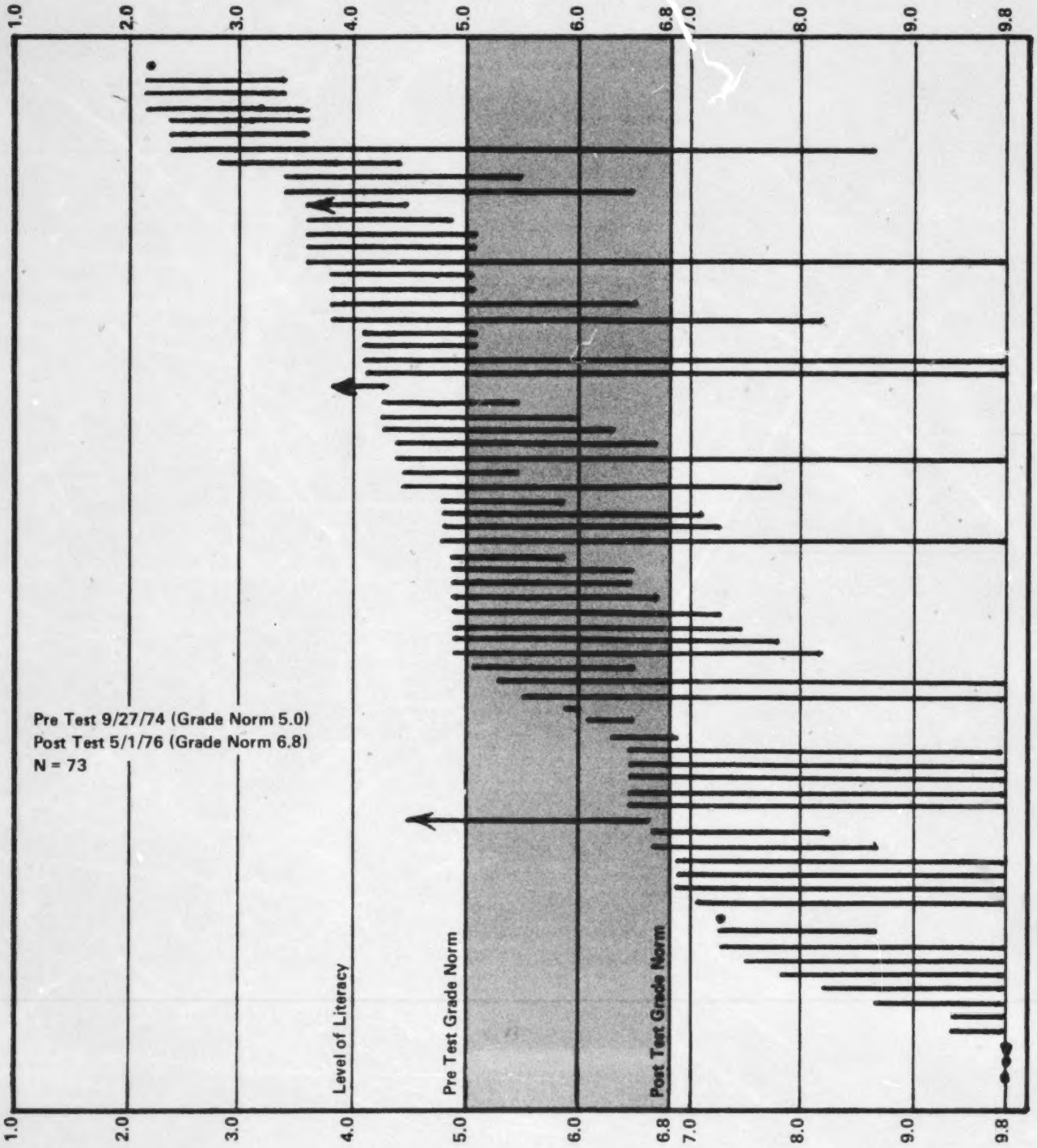


TABLE VIII SHOWS THE RANGE OF READING COMPREHENSION GROWTH FOR EVERY STUDENT IN THE SIXTH GRADE STUDY.

SUMMARY

The Formula Phonics Reading Chain Program at Roosevelt School in Santa Barbara, California, has in two years replicated—in terms of program design, administration, staff development, teaching effectiveness, and student achievement—the nationally honored program at Patterson Road Elementary School in Orcutt, California.[1] This outcome is particularly significant because while the student population at Patterson Road School is upper-lower and lower-middle income and 97% majority ethnic, the student population at Roosevelt School is integrated ethnically and by social class. The socio-economic index for Roosevelt School is at the 27th percentile for all elementary schools in California and 40% of the students are Spanish surnamed.

Roosevelt School appears to be one of the few artificially integrated schools where a specific reading program has raised reading scores for both the "home" and the "bused" girls and boys. Indeed, a careful study of Tables II, IV, and VI shows that specific reading disability is being nearly eliminated in the school. Given 4.0 as a standard measure of literacy, only 13 of 39 (33%) of fourth graders, 7 of 58 (12%) of fifth graders, and 5 of 73 (7%) of sixth graders had Total Reading scores below that grade level on May 1, 1976. It should be noted also that the educational growth resulting from participation in a Formula Phonics Reading Chain Program is cumulative and at Roosevelt School the fifth graders will enjoy one more year in the program and the fourth graders two more years!

[1] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, CA. 1975. Available through ERIC Document Reproduction Service, ED 112 367.

Roosevelt School Profile

The information which follows is presented so that the reader will be able to contrast school and community factors at Roosevelt School with other schools.

Ethnic Distribution—February, 1976

Anglo 189 (53%); Spanish Surnamed 143 (40%); Black 14 (4%); Oriental 7 (2%); Total Enrollment 353; Combined Minority Students 164 (46%).

S.E.S. Data from April, 1975, California Assessment Program Report

Socio-Economic Index—
State Percentile Rank 27
Parent Education Index—
State Percentile Rank 41

Reading Test Results from 1975, California Assessment Program Report

(After the *first* year of the Formula Phonics Reading Chain Program)
Grade 6—State Percentile Rank 68
Grade 3—State Percentile Rank 56

School-Community Description for Program Year 1975-1976

Roosevelt School is considered as urban in makeup with approximately 45% minority students drawing from two economic and cultural areas. Approximately 87% of the students and 75% of the parent population are English speaking. The socio-economic characteristics range from poverty to highly affluent. Santa Barbara is recognized for its availability of educational and cultural experiences particularly in the areas of art, music and historical contributions. The University of California and the Community College with Adult Education also offer considerable cultural activity for parents and students.

There is difficulty involved in the sister school concept where a majority of parents have students attending Lincoln and Roosevelt since both schools are considered separate in terms of PTA, Advisory Committees, room mothers, and other school activities. This creates double involvement for a great number of Comp. Ed. parents (serving on two SACs, working for two PTAs, being a room mother in two schools, working on two carnivals, working as a parent volunteer in the classroom). We find our sister school has run into the same kinds of problems for the parents of identified Comp. Ed. students.
—Report to the California State Department of Education

Funding

District; S.B. 90; E.S.A.A.; and Title I of E.S.E.A.
Approximately 140 students, virtually all of them bused, qualify for Title I funding.

Primary Reading Program at Lincoln School

Kindergarten: Readiness
First Grade: Open Court
Second Grade: State Basal Text Series

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The Formula Phonics Reading Chain Program at Bent-Mescalero Elementary School Mescalero Apache Reservation— Tularosa, New Mexico Public Schools

School Year 1975-1976

The Program

The Formula Phonics Reading Chain Program at Bent-Mescalero School is a component of the Tularosa Title IV Project and this project's goal is "to improve the reading skills of Indian students." This study treats with the Reading Chain Program's effectiveness during its second year in operation. External evaluator for the program is Southwest Research Associates (SWRA) of Albuquerque, New Mexico. All test data in this study is drawn from that organization's *Final Evaluation Report.*[1]

The Formula Phonics Reading Chain Program was initiated during school year 1974-75; and because of the special nature of the student population, the entire first semester was spent in program design, staff development, and funding students with the initial phonetic information used in the system's spelling and decoding components. Thus, students did not begin meeting each day in their ungraded, homogeneously staffed Reading Chain Language Processing Groups until January, 1975.

The SWRA report states, "As might be expected, the reading gains made in 1974-75 were not high; but, apparently, the groundwork was laid for a successful reading program."[2] *Stanford Achievement Test (S.A.T.)* scores following the program's first year, 1974-75, showed the mean per-pupil gain in grade equivalent scores for all pupils, grades 2–6, was 0.6 over the seven month pre and post testing period. This was the same mean gain seen in 1973-74, before the program started.

Because a substantial number of students are not native speakers of English or else do not have complete facility with that language, the school provides a bilingual program which is funded under Title VII of E.S.E.A. Since discussion and language processing may go forward in two or more languages in a Dialog Group, the Formula Phonics program furnished the entire oral language arts component for the school's bilingual project.

By September, 1975, the program at Bent-Mescalero School had matured so completely that it represented an excellent replication of the nationally honored program at Patterson Road Elementary School in Orcutt, California[3] and of many other Reading Chain programs both urban and rural. Descriptions of the Bent-Mescalero program from the SWRA report follow:[4]

---

[1] *Final Evaluation Report for Tularosa Title IV Project.* Submitted June 22, 1976. Available through Southwest Research Associates, Albuquerque, New Mexico.

[2] *Ibid.*, p. 4.

[3] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, California. 1975. Available through ERIC Document Reproduction Service, ED 112-367.

[4] *Final Evaluation Report, op. cit.*, pp. 7-9.

FINDINGS:

- *During a site visit by SWRA, on September 18, 1975, it was found that a Chain of homogeneous reading groups had been organized and placed in operation on September 15. Pupils, grades 3–6, who participated in Formula Phonics the previous year were assigned to groups which met from 9:00 to 10:00 a.m. daily. Each group was instructed by a teacher who had experience in teaching reading by the Formula Phonics method the previous year.*

  Eight teachers, all second grade pupils, and all transfer pupils new to Formula Phonics were being programmed in preparation for entry into the Chain at a later date.

  An innovative and attractive chart of the Reading Chain had been developed and placed on the wall of the teachers' lounge. Each column on the chart represents a reading group and contains the names of pupils comprising the group, with the name of the teacher currently instructing the group appearing at the top of the column. Names are on the cards which are partially inserted into little envelopes fastened to the chart, leaving the upper portion of the card containing the name exposed and visible. Cards can easily be moved when teachers or pupils change groups. Also, the envelopes are used to store certain pupil reading data. Colors of name cards indicated pupil grade level. Information readily available on the chart includes each pupil's grade, reading group, reading test scores, and books read.

  Subsequently, new teachers and pupils were included in the Reading Chain after completing programming. At the end of each five weeks, teachers met to receive their new group assignment and to reassign any pupils who might be more appropriately placed in a different group. The teachers changed group teaching assignments six times during the school year.

- *During a site visit by SWRA on February 11, 1976, three Formula Phonics classes were observed. It was evident that most pupils had learned the word attack system and were able to apply it, and it was noted that dialoging was being carried on successfully with excellent pupil participation. Also observed during the visit was a programming session being conducted in the Media Center for a small group of pupils who had not mastered the Formula Phonics system sufficiently to function well in the reading groups.*

- *The evaluators were informed, during a visit on May 24, 1976, that these programming sessions were conducted during the reading period, every day throughout the entire year, with the group changing each five weeks—another example of the thoroughness of the reading effort at Bent-Mescalero.*

- *During the site visit of May 24, 1976, SWRA evaluators looked over the Formula Phonics materials and were impressed with the excellent arrangement and organization of books and other materials.*

  Some 140 titles of 30 copies each in paperback were observed to be neatly shelved in alphabetic order by author. We were informed that about 75 additional titles have been ordered for next year. Since the Formula Phonics Reading System uses books selected by the group teachers as its basic reading materials, it is important that interesting and appropriate books be available to teachers. Quality of books on the Formula Phonics shelves seemed excellent. In this regard, one of the strengths of the Formula Phonics Reading System seems to be that it stimulates pupils to read on their own because they handle, read, and enjoy books that they can pick up at any bookstore, or possibly even at the corner drug store.

All books are listed in a card file. In another file are listed many available supplementary reading materials, including booklets of stories made from pages from portions of old textbooks, slides, tapes, and magazines. Another file is maintained with suggestions for supplementary reading activities.

Learner Verification

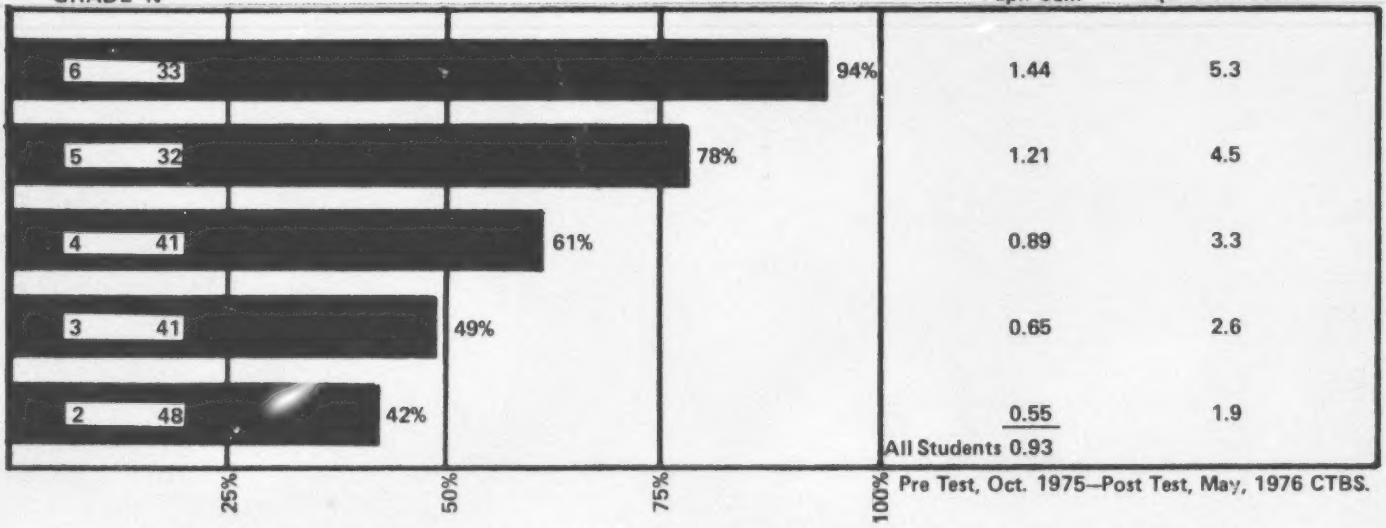
Students at Bent-Mescalero School are pre tested in early October and post tested in early May each year—a period of seven months, 0.7. Baseline data for the school year immediately before the program began, 1973-74, and for the first year of the program, 1974-75, are from the *Stanford Achievement Test (S.A.T.)*. Data for the current study, school year 1975-76, are from the *Comprehensive Test of Basic Skills (C.T.B.S.)*.

During the 1975-76 test period, 195 pupils in grades 2-6 had both pre test and post test scores. The SWRA report says:[5]

The data show that 121 of the 195 pupils, or 62%, made gains of 0.7 or more in grade equivalent scores in reading in the seven-month span between pre test and post test. Since a gain of 0.7 in seven months is considered average, it would be normal to expect that some pupils would make gains of 0.7 and about half of the remaining pupils would make gains greater than 0.7 and the other half would register gains of less than 0.7 in the seven-month span. In actuality, 115 pupils gained more than 0.7, and only 74 gained less than 0.7. Furthermore, the average per-pupil gain was 0.93.

This information is displayed in Table I.

Table I
Percent of Students Making
0.7 or Greater Gains 1975-1976

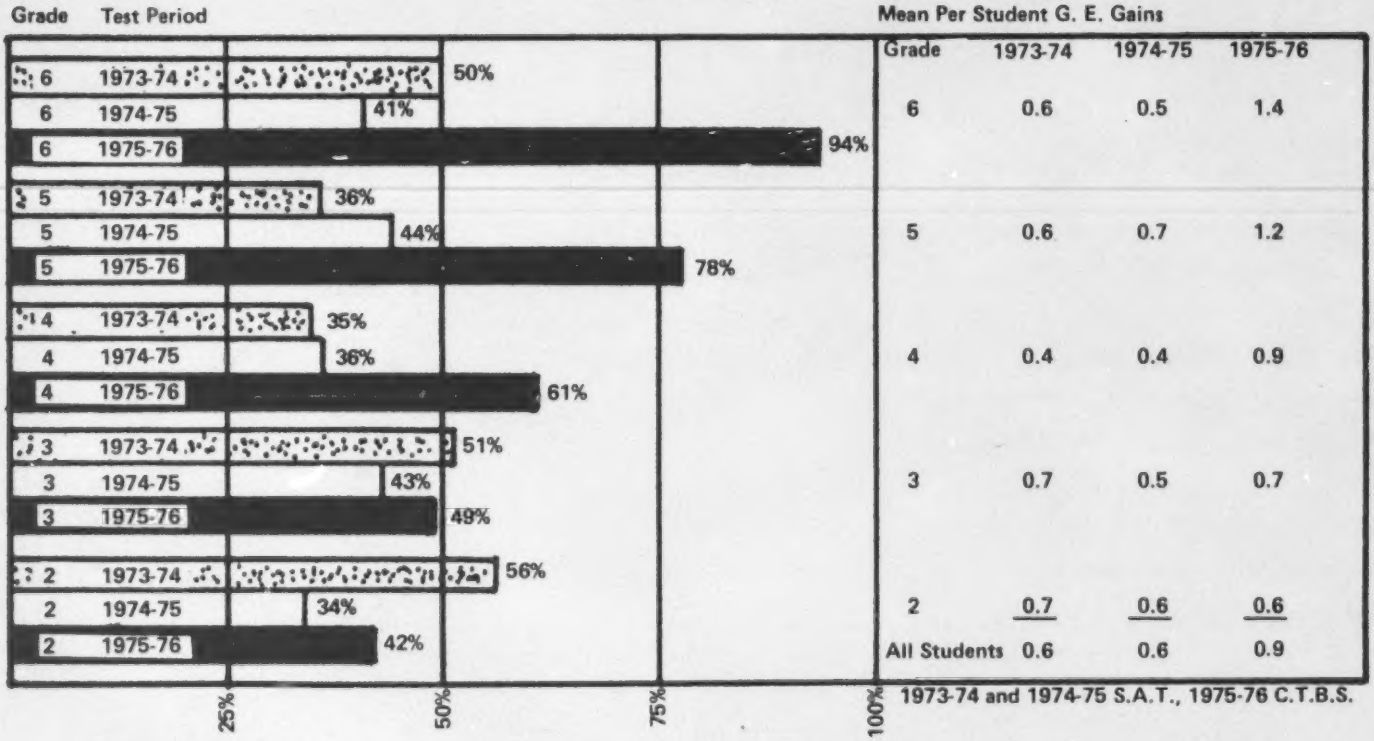


THE ABOVE DATA ARE MOST INTERESTING AND ENCOURAGING BECAUSE THEY DIFFER IN A DESIRABLE DIRECTION FROM THE USUAL FINDINGS OF STUDIES OF ACADEMIC ACHIEVEMENT, INCLUDING READING, OF INDIAN PUPILS. MOST SUCH STUDIES SHOW STEADY, BUT LESS THAN NORMAL, ACHIEVEMENT GAINS AS PUPILS PROGRESS THROUGH SCHOOL, RESULTING IN INCREASING EDUCATIONAL DEFICITS. A FEW STUDIES EVEN SHOW DECREASING GAINS BEGINNING IN THE UPPER ELEMENTARY GRADES. SIGNIFICANTLY, THE ABOVE DATA INDICATE INCREASING GAINS IN PROGRESSIVELY HIGHER GRADES WHICH IS UNUSUAL, AND HIGHLY COMMENDABLE.[6]

[5] *Ibid.*, p. 3.
[6] *Ibid.*, p. 4.

Table II compares post test reading data for the last year before the program began, 1973-74; for the first year of the program after all grade 2–6 students had been in Formula Phonics Reading Chain Groups about four months, 1974-75; and for the second year of the program after the typical second grader had been in the Reading Chain Program seven months and typical third through sixth graders had been in Reading Chain Dialog Groups about twelve months. The 1975-76 testing found the mean per-pupil reading gain in grade equivalent scores for all pupils, grades 2–6, had improved 0.3 from the 0.6 gain in 1973-74 and 1974-75 and was 0.9.

Table II
Percent of Students Making 0.7
or Greater Grade Equivalent Gains
During Three Testing Periods



Mean Per Student G. E. Gains

Grade	1973-74	1974-75	1975-76
6	0.6	0.5	1.4
5	0.6	0.7	1.2
4	0.4	0.4	0.9
3	0.7	0.5	0.7
2	0.7	0.6	0.6
All Students	0.6	0.6	0.9

1973-74 and 1974-75 S.A.T., 1975-76 C.T.B.S.

THE 1974-75 AND 1975-76 DATA PRESENTS A CLASSICAL PROFILE OF THE EDUCATIONAL OUTCOMES WHICH THE FORMULA PHONICS READING CHAIN PROGRAM PRODUCES IN STUDENT POPULATIONS THAT ARE GENERALLY ISOLATED FROM THE MAINSTREAM POPULATION, WHETHER SUCH ISOLATION IS OCCASIONED BY FACTORS RELATED TO CULTURE, LANGUAGE, ETHNICITY, OR SOCIAL CLASS. IT CAN BE SEEN THAT FOR ALL FIVE CLASSES, 1975-76, THE ACHIEVEMENT GRADIENT TURNED SHARPLY UPWARD–INCREASING IN EACH HIGHER GRADE LEVEL–AS STUDENTS MELDED THEIR PREVIOUS LEARNING WITH THE VASTLY INCREASED FLOW OF KNOWLEDGE WHICH THEIR FORMULA PHONICS READING CHAIN LANGUAGE PROCESSING EXPERIENCES PROVIDED.

Table III follows three groups of the *same* students during the testing periods in 1973-74, 1974-75, and 1975-76, and it shows the percent of those students registering 0.7 or greater grade equivalent gains on each test. Group A was first tested as second graders in May, 1974, Group B as third graders, and Group C as fourth graders. Students were tested in May, 1974 and 1975 with the *S.A.T.* and in May 1976 with the *C.T.B.S.*

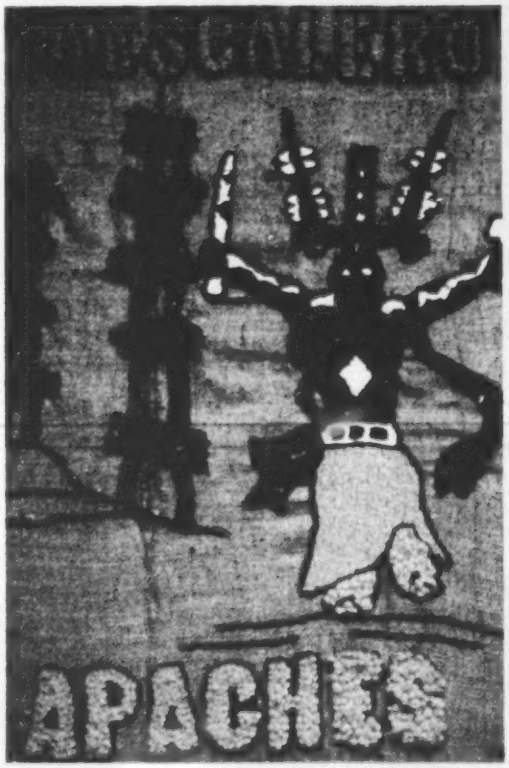


Table III
Percent of *Same* Students Registering 0.7 or Greater Grade Equivalent Gains

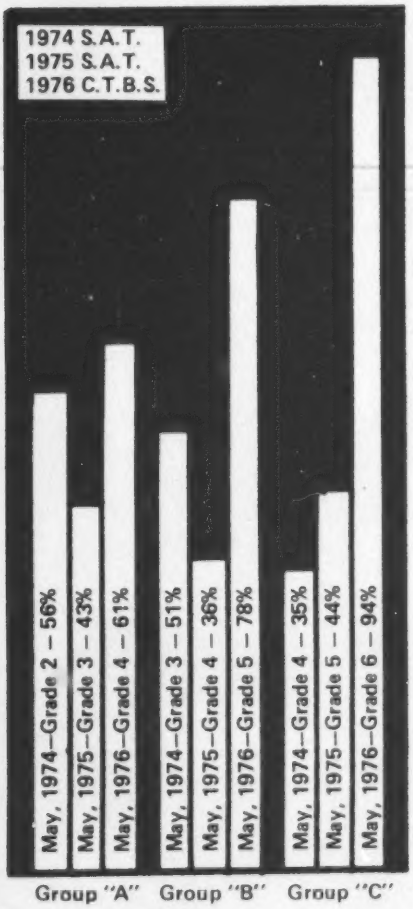


TABLE III SHOWS HOW THE FORMULA PHONICS READING CHAIN PROGRAM EXPERIENCE HAS AFFECTED STUDENT ACHIEVEMENT OVER TIME. IN 1973-74, FOR INSTANCE, ONLY 35% OF THE SCHOOL'S FOURTH GRADERS REGISTERED 0.7 OR GREATER GRADE EQUIVALENT GAINS. IN 1974-75 WHEN THEY WERE FIFTH GRADERS, THE PERCENTAGE HAD INCREASED TO 44%. IN 1975-76 WHEN THEY WERE SIXTH GRADERS, THE PERCENTAGE HAD INCREASED TO 94%! THESE DATA SHOULD BE VIEWED WITH THE KNOWLEDGE THAT MANY OF THE SCHOOL'S YOUNGER STUDENTS HAVE HAD CONSIDERABLE LESS EXPOSURE TO ALL AVENUES OF COMMUNICATION IN ENGLISH THAN HAVE THE OLDER GIRLS AND BOYS.

Achievement patterns found at Bent-Mescalero School after the 1975-76 school year are consistent with those found in recent studies of Formula Phonics Reading Chain Programs in the Atascadero, Orcutt, and Santa Barbara, California School Districts—where much different student populations are enrolled.[7]

In those programs upper elementary students generally improve at a higher rate than do primary girls and boys; significant growth in reading achievement is found to be occurring in most students so that over time reading disability is being generally eliminated and the effects of the program are found to be cumulative. It is not surprising that the patterns of growth in reading achievement of the Mescalero Apache youngsters in the Tularosa Title IV Project parallel those for the children in the California programs because in every case they are exposed to the exact same Formula Phonics Reading Chain program elements and teaching strategies.

Summary

Data produced at Bent-Mescalero Elementary School shows that after the first full year in Formula Phonics Reading Chain Reading-Language Processing Groups the rate of gain in reading achievement school-wide, and particularly for upper elementary children, is significantly higher than in earlier years. Mean reading gains school-wide were nine months during the seven month testing period and sixth graders averaged fourteen months improvement—two months growth for each month of instruction. It was also found that school-wide 59% of the students (115 of 195) gained in reading grade equivalent scores above the 0.7 rate of expectancy while only 38% (74 of 195) gained less. The percentage of students making a month for a month or higher gains increased from 42% in grade two to 94% in grade six.

These results would seem to obtain because the Tularosa Title IV Project follows the Formula Phonics Reading Chain program design, staff development, and teaching guidelines exactly. The SWRA evaluation of the program contains these words:[8]

> *The Formula Phonics Reading System should become increasingly effective as teachers and pupils perfect their skills in word attack and dialoging techniques through continued study of programming tapes and classroom practice. Judging from results of the use of the System in other schools, learning apparently pyramids rapidly as these skills are mastered. Test results at Bent-Mescalero in 1975-1976 seem to indicate that this will happen there.*

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[7] *The Formula Phonics Reading Chain Programs in the Elementary School of the Atascadero, California Unified School District: School Year—1975-1976*
The Formula Phonics Reading Chain Program at Patterson Road Elementary School: School Year--1975-1976
The Formula Phonics Reading Chain Program at Roosevelt Elementary School, Santa Barbara, California: School Year—1975-1976
Integrative Learning Systems, Inc., Glendale, CA 91204. 1976.

[8] *Final Evaluation Report, op. cit.*, p. 5.

Bent-Mescalero School Profile

Bent-Mescalero School is a public school located on the reservation of the Mescalero Apache nation. The two closest cities are Alamogordo, New Mexico and El Paso, Texas. Most students are bused to the school each day. While only about 20% of the homes of students have television sets, all have electricity, running water, and inside facilities. All families have access to television in the reservation's community centers. Most parents are employed in lumber, cattle, or recreational (ski lift) industries, or else work in local hospitals, community centers, or schools.

Ethnic Data

Total School Population 367
- Apache 312 (85%)
- Spanish Surnamed 37 (10%)
- Anglo 19 (5%)

Funding

State funds; Johnson-O'Malley Funds; Federal Indian monies; and Titles I, IV, and VII of E.S.E.A.

Primary Reading Program in Grades K-1

Houghten-Mifflin series

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The Formula Phonics Reading Chain Program at Mandaree Elementary School Fort Berthold Indian Reservation Mandaree School District No. 36, North Dakota

School Year 1975-1976

Background

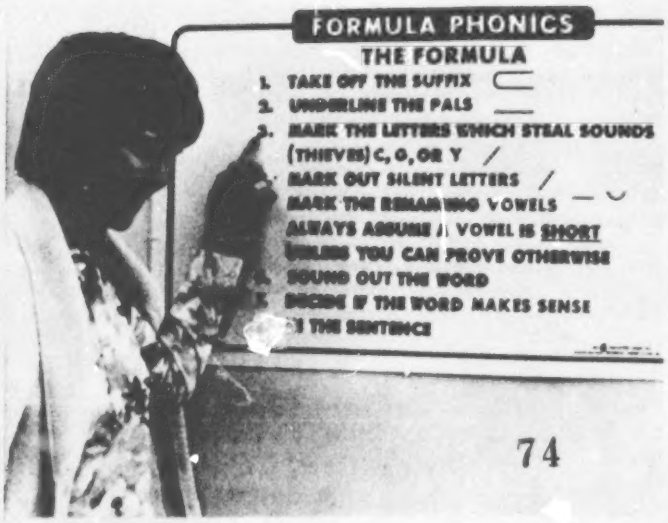
The Formula Phonics Reading Chain Program at Mandaree School was started in September, 1974, and all students in grades two through six participate. Initially funded under Title I of E.S.E.A., the program is currently maintained with school district funds. Most of the children are members of the Three Affiliated Tribes (Arikara, Hidatsa, and Mandan). In 1972 the school severed its affiliation with the Bureau of Indian Affairs and became a public school.

The Program

The Reading Chain at Mandaree School follows the Formula Phonics program guidelines very closely. There is a single Reading Chain which serves all students in grades two through six, the spelling and writing component is taught in the Reading Chain Dialog Groups, and all of the reading-language processing procedures are used with curriculum materials in the regular classrooms. From time to time the Reading Chain groups are videotaped and the tapes replayed for the children's viewing. Students then critique their own and each other's oral language behaviors by way of discussion and writing. Older children may write a contract to help reinforce their plan which might be to read aloud with more expression, to speak more clearly, or to use an expanded vocabulary when speaking.

Learner Verification

Students were pre tested in September, 1975, and post tested in May, 1976—a period of eight months—with the *Iowa Tests of Educational Development*. The school has provided Reading Comprehension, Total Language, and Total Mathematics scores for 45 students in grades three through six for whom there were pre and post test scores. These data show that 29 of 45 students, or 62%, made gains of 0.8 or more in grade equivalent scores in Reading in the eight month span between pre and post tests.


FORMULA PHONICS
THE FORMULA
1. TAKE OFF THE SUFFIX
2. UNDERLINE THE PALS
3. MARK THE LETTERS WHICH STEAL SOUNDS
(THIEVES) C, G, OR Y
MARK OUT SILENT LETTERS
ALWAYS ASSUME A VOWEL IS SHORT
SOUND OUT THE WORD
IN THE SENTENCE

A gain of 0.8 in eight months being considered average, it would be expected that some students would make gains of 0.8 and that of the remaining students about half would make gains greater than 0.8 and the other half register gains less than 0.8. In actuality, 6 students showed 0.8 improvement; 23 students gained more than 0.8; and the average per-student gain was 1.3.

Achievement scores in Total Language show that 28 of 42 students, or 67%, made gains of 0.8 or more. In the sample, 4 students made gains of 0.8; 24 students gained more than 0.8; and the average per-student gain was 1.0.

Achievement scores in Total Mathematics show that 32 of 45 students, or 71%, made gains of 0.8 or more. In the sample, 6 students made gains of 0.8; 27 students gained more than 0.8; and the average per-student gain was 1.1.

This information is displayed below:

ACHIEVEMENT DATA INCLUDING PERCENT OF STUDENTS WITH 0.8 OR GREATER GAINS 1975-1976

	READING				LANGUAGE				MATHEMATICS			
Grade	N=	%	Mean Per Pupil Gain	Mean Grade Equivalent Score	N=	%	Mean Per Pupil Gain	Mean Grade Equivalent Score	N=	%	Mean Per Pupil Gain	Mean Grade Equivalent Score
6	12	75%	1.8	6.3	12	75%	1.8	6.2	13	69%	1.1	5.9
5	7	43%	2.1	4.9	5	60%	1.4	5.0	7	57%	1.1	4.9
4	11	64%	1.1	3.5	10	50%	0.4	3.8	11	73%	1.4	4.2
3	15	60%	0.7	2.8	15	73%	1.0	2.7	14	79%	1.0	3.2
Totals	45	62%	1.3		42	67%	1.0		45	71%	1.1	

Pre Test, Sept. 1975—Post Test, May, 1976
Iowa Tests of Educational Development

MOST STUDIES ON ACADEMIC ACHIEVEMENT OF NATIVE AMERICAN CHILDREN "SHOW STEADY, BUT LESS THAN NORMAL, ACHIEVEMENT GAINS AS PUPILS PROGRESS THROUGH SCHOOL, RESULTING IN INCREASING EDUCATION DEFICITS. A FEW STUDIES EVEN SHOW DECREASING GAINS BEGINNING IN THE UPPER ELEMENTARY GRADES."[1] HOWEVER, RECENT STUDIES SHOW THAT ACHIEVEMENT SCORES FOR OLDER ESKIMO[2] AND MESCALERO APACHE[3] CHILDREN WHO PARTICIPATE IN FORMULA PHONICS READING CHAIN PROGRAMS DO NOT SHOW THESE PATTERNS. INSTEAD, IT IS SEEN THAT, GENERALLY, UPPER ELEMENTARY STUDENTS (4-8) SHOW A HIGHER LEVEL OF ACHIEVEMENT THAN DO PRIMARY (2-3) STUDENTS. THIS SAME PATTERN IS FOUND AT MANDAREE SCHOOL WHERE THE AVERAGE THIRD GRADER SCORED IN READING A YEAR BELOW GRADE NORM, FOURTH GRADERS SCORED 13 MONTHS BELOW, FIFTH GRADERS SCORED 9 MONTHS BELOW, AND SIXTH GRADERS ONLY 5 MONTHS BELOW. IT SHOULD BE NOTED ALSO THAT CURRENT STUDIES OF FORMULA PHONICS READING CHAIN PROGRAMS IN SEVEN ELEMENTARY SCHOOLS IN CALIFORNIA[4] REVEAL THESE SAME PATTERNS OF ACHIEVEMENT IN STUDENT POPULATIONS FROM VARYING SOCIAL CLASSES AND ETHNIC BACKGROUNDS.

THE CALIFORNIA STUDIES ALSO SHOW THAT WHEN THE FORMULA PHONICS SPELLING-WRITING COMPONENT IS INTEGRATED INTO THE LANGUAGE PROCESSING PROCEDURES EMPLOYED BY TEACHERS BOTH WITH THEIR READING GROUPS AND IN THEIR CLASSROOMS, AS IS DONE AT MANDAREE SCHOOL, ACHIEVEMENT SCORES IN LANGUAGE AND MATHEMATICS IMPROVE TO ABOUT THE SAME LEVEL AS DO THE READING SCORES. THIS PATTERN IS CLEARLY SEEN IN THE MANDAREE DATA.

[1] *Final Evaluation Report for Tularosa Title IV Project.* Submitted June 22, 1976. Available through Southwest Research Associates, Albuquerque, New Mexico.

[2] *The Formula Phonics Reading Chain Program at Patterson Road Elementary School—A Dissemination-Replication Study.* Integrative Learning Systems, Inc., Glendale, California. 1975. Available through ERIC Document Reproduction Service, ED 112-367.

[3] *The Formula Phonics Reading Chain Program at Bent-Mescalero Elementary School, Mescalero Apache Reservation—Tularosa, New Mexico Public Schools, School Year 1975-1976.* 1976. Available through Integrative Learning Systems, Inc., Glendale, California.

[4] *Replicating the Formula Phonics Reading Chain Program—School Year 1975-1976.* 1977. Available through Integrative Learning Systems, Inc., Glendale, California.

Budget Considerations

In a small school with about 100 students, such as Mandaree, first year costs for all Formula Phonics Reading Chain program design, staff development, and student materials (16 video cassette programs, teaching manuals, poster-wall charts and student reading and spelling workbooks) is about $3,100.00. Each year thereafter materials necessary to bring about 35 new students into the program cost $80.00. After five years the Formula Phonics program materials will have cost about $3,400.00.

Summary

Second year data from Mandaree School show that its Formula Phonics Reading Chain Program is resulting in patterns of student achievement which are markedly different from those usually found in populations where the children are poor, racially and culturally different, and living in rural isolation. At the school, upper elementary children (5-6) are achieving closer to grade norms in Reading than are the younger children (3-4); and scores in Language and Mathematics for all grades are generally as high, or higher, than are the Reading scores. This is significant because these same patterns also are found in majority ethnic, middle-income schools in California that are employing Reading Chains. And these same patterns of achievement are also being found in Apache children after the second year of the Formula Phonics Reading Chain Program at Bent-Mescalero School on the Mescalero Apache Reservation in New Mexico.

One reason that the programs in the Indian schools are producing the same patterns of student achievement as found in the California programs that were studied, is that all of the schools follow the *same* Formula Phonics Reading Chain program design, staff development, curriculum, and teaching guidelines. As in those other schools, Mandaree's Reading Chain provides a near perfect in-school environment for both teaching and learning reading, spelling, writing, listening, speaking, and thinking skills. This is important. B. F. Skinner has written, *It is true that man's genetic endowment can be changed only very slowly, but changes in the environment of the individual have quick and dramatic results.*[5]

Further, the program's language processing techniques give Mandaree's students access to any curricular material written at their instructional—not reinforcement—reading level. By always working in difficult reading matter at the students' instructional level, teachers are able to move their girls and boys into the higher levels of language processing.

It should be noted that although the outcomes reported in this study are most encouraging, they occurred only after the program's second year. There is, however, every indication that achievement scores will continue to rise; for wherever Formula Phonics Reading Chain Program guidelines are followed as strictly as they are at Mandaree School, the effect on student achievement is cumulative and it accelerates over time.

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[5]B. F. Skinner, *Beyond Freedom and Dignity*. Alfred A. Knopf, Inc., New York, New York. 1971. pp 18-19.

Mandaree Elementary School Profile

Mandaree is a small rural Indian community located on the west segment of the Fort Berthold Indian Reservation in northwestern North Dakota. The students at Mandaree School are enrolled members of the Three Affiliated Tribes (Mandan, Hidatsa and Arikara). In the past a small number of students have been non-Indian.

Due to the Garrison Diversion Project, the Missouri River flooded its lowlands in the early 1950's. As a result the Mandaree Community was established by the relocation of the Indian people from the river bottom lands. This caused a radical disruption of the economic base and social structure of the Indian people. The effects of this move are still evident. Many families have incomes below poverty level while others have a moderate income.

The Kindergarten teacher uses the Distar readiness program. The first grade teacher uses both Ginn and Houghton Mifflin along with the Reardon, Baer Co. Phonics Workbook. However, the second semester of the first grade she uses the Formula Phonics Program and before May she has taken the first graders through all of the video tapes and has her own Reading Chains going within the first grade. She has found this very successful and it has been a boon to those students because they come into the second grade knowing the system. The second graders are then taken through the video tapes again when school begins in September. The second six weeks they are put into a regular Reading Chain group as are the third through sixth graders.

When we began our program, we were funded by both Title I and the School District but now the program is run pretty much by the School District. Our school has been a Public School for nearly five years. Originally it was a Bureau of Indian Affairs school.

The elementary grades have approximately 100 students and we are departmentalized. Our departmentalized system has been in effect now for four years and we consider it very successful. Each teacher is teaching in his or her area of strength. We begin each day with a 40-minute Reading Chain at which time all the elementary teachers and aides are involved. By having the Chain the first thing in the morning we have cut down on our tardiness almost 100%.

--Patricia Carroll, Principal

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The Formula Phonics Reading Program at Mountain View High School El Monte, California

School Year—1975-1976

Background

The Formula Phonics Reading-Language Processing System was first selected for use at Mountain View High School during school year 1973-74 and has been retained during each successive school year. The school had previously employed a laboratory approach, with all ninth grade students receiving a single six to eight week concentrated reading course and then spending the remainder of the year in English classes. Such comprehensive intervention is necessary because 85% of the entering freshmen score below grade norms on the Nelson Reading Test. 70% of the students at Mountain View High School represent minority ethnic groups. 65% of the students are Spanish surnamed. Entering the school from four feeder elementary school districts, students have received no consistent reading approach and many of them have no basic decoding skills, according to high school personnel.

The Program

In Formula Phonics schools, most staff development in how to use the system's decoding, spelling, discussion, and other language processing strategies is accomplished by having teachers and aides watch a series of video programs and by reading teaching manuals. Since video programs are also used to fund all students in the program with the *same* phonetic information, vocabulary, and skills, any trained teacher can work with any group of target students. According to Anita Weakley, Special Programs Coordinator at Mountain View High School,[1]

> *The Formula Phonics Videotape Reading Program was chosen as the reading program for the school because of the following features:*
>
> 1. *All teachers could receive training.*
> 2. *All teachers could use a consistent approach to decoding skills.*
> 3. *All English teachers could be teachers of reading.*
> 4. *All content area teachers could reinforce the reading instruction in their classes.*

After the first year (1973-74) of the program, Ms. Weakley was able to report to the faculty:[2]

> *Formula Phonics Works!*
>
> *The goals and objectives set for our 1973-74 ESEA Proposal were reached. The Nelson Reading Test was given in September and May, for pre and post reading scores, to all freshmen and sophomore students. Only those students scoring below grade level were eligible to be selected as "identified" students.*
>
> *All "identified" students, therefore, had averaged less than 1 month's growth for 1 month's instruction prior to September. Our freshmen "identified" students increased their reading scores on an average of 1.6 years or 2 months growth for each month of instruction this year. SUPER FANTASTIC!*

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[1] Weakley, Anita, *A Comparison of Reading Achievement of Ninth Grade Students Who Participated in Different Reading Programs*, Research Project. California State University, Los Angeles. 1976. p. 3.

[2] *Read Power*, Volume 1, No. 1. Mountain View High School, El Monte Union High School District. June 11, 1974.

Many students made 2, 3, 4, and up to 5.5 year jumps this year. Several students previously reading below grade level scored above 12th grade level in May.

During school year 1974-75 the same high level of growth in reading achievement for Compensatory Education students was maintained and Mountain View High School continued to rank as one of the highest achieving Title I schools in reading improvement in the state.

Learner Verification—School Year 1975-76

During school year 1975-76 Mountain View High School was studied by an accreditation committee for the Western Association of Schools and Colleges. In its report to the Association, the staff at the school described its reading program in this manner:[3]

The Formula Phonics Reading Program has met with great success. Incoming freshmen students have gained approximately two months growth for every month of instruction during the last two years. This could be attributed to the new Reading Program. Many content area teachers have worked to make this program feasible.

In the "Visiting Committee Report"[4] the Formula Phonics program was commended in sections treating with:

1. *Curriculum: The implementation of a reading program in an attempt to upgrade students' reading skills*
2. *Materials and Instruction: The development and use of the reading materials and Formula Phonics Program.*
3. *Instructional Staff: The willingness on the part of most teachers to work diligently on a school-wide reading program.*

After studying the "Visiting Committee's Report" the Accrediting Commission for Secondary Schools offered congratulations on the quality of work being done in the school and granted a full term of accreditation through June 30, 1981.

During school year 1975-76 a Bilingual Project with a Formula Phonics component was funded under California's AB 2284. The project's external evaluator was KXL Associates. The following material is drawn from their "Final Report" dated July 13, 1976:[5]

The students participating in the reading program participated in Formula Phonics activities in the Reading Lab and their English class. For students with special needs, bilingual aides and teachers conducted oral dialog sessions to reinforce reading and subject related content. Audio visual hardware and software presented in English and Spanish was available for independent study. A skills continuum gave direction to individualization of instruction and to serve as a guide for extra assistance to students with skill deficiencies. As a result of these activities the following gains in achievement were made.

Average gain on the Nelson Reading Test for 7 "Limited English Speaking" and 8 "English Dominant" students in Grade 9 was 1.45 grade equivalents.

Average gain on the Nelson Reading Test for 13 "Limited English Speaking" and 4 "English Dominant" students in Grade 10 was 1.0 grade equivalents.

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[3] *Accreditation Report for the Western Association of Schools and Colleges,* Form A, 1975-76. Mountain View High School, El Monte, California, April 5, 6, 7, 1976.

[4] *Ibid.,* "Visiting Committee Report" section. Submitted by: Chairman, Dr. Eileene R. LaBarthe, Assistant Superintendent, Garden Grove Unified School District; Members, Dr. Clay B. Christensen, Associate Professor of Spanish, San Diego State University; Mr. John D. Falxa, Principal, Reseda High School; Mr. Duff D. Means, Principal, Lawndale High School; Mr. Alex Morel, Instructor, English, ESL, Spanish, John Burroughs High School. pp. 5, 7, and 11.

[5] *Final Report AB 2284 Bilingual Project, Mountain View High School.* Submitted by KXL Associates, July 13, 1976, pp. 2-6.

Average gain on the Nelson Reading Test for 4 "Limited English Speaking" and 2 "English Dominant" students in Grade 11 was 1.02 grade equivalents.

The reading component of the program met its objectives in English as stated. The number of students who gained more than one year is to be commended.

Objective data for school year 1975-76 is found in the *Consolidated Evaluation Report* which was submitted to the California State Department of Education by El Monte High School in July, 1976.[6] The following table shows outcomes for "identified" students as reported in that document.

Table I

Growth in Reading Mean Raw Scores for "Identified" Ninth and Tenth Graders

GRADE	N=	LANGUAGE GROUP	MEAN RAW SCORES	
			Pre Test 9-5-75	Post Test 5-5-76
9	242	FLUENT–ENGLISH-SPEAKING	70.9	88.0
9	40	LIMITED–ENGLISH-SPEAKING	54.5	72.1
10	6	LIMITED–ENGLISH-SPEAKING	24.3	43.7
9	11	NON-ENGLISH-SPEAKING (Post Test Only)		18.3
10	3	NON-ENGLISH-SPEAKING (Post Test Only)		18.0

Nelson Reading Test, Form A (Ninth Grade), Form B (Tenth Grade)

THIS TABLE SHOWS GROWTH IN MEAN RAW SCORES FOR "IDENTIFIED" COMPENSATORY EDUCATION STUDENTS WHO PARTICIPATED IN MOUNTAIN VIEW HIGH SCHOOL'S FORMULA PHONICS READING PROGRAM. FOR THE THIRD CONSECUTIVE YEAR THE SCHOOL WAS ABLE TO REPORT "COMPLETE ATTAINMENT" OF THEIR PROGRAM'S READING COMPONENT OBJECTIVE.

[6] *Phase I, Consolidated Evaluation Report, 1975-76.* Submitted to the California State Department of Education, Office of Program Evaluation and Research. July, 1976.

Summary

In school year 1973-74 a Formula Phonics Reading Program, funded under Title I and California's S.B. 90, was started at Mountain View High School in El Monte, California, to provide a "school-wide" reading program for freshmen students reading below grade norms. In each of the three years of its existence the reading component in the school-wide program has resulted in growth in achievement in reading which has met or exceeded project objectives.

In 1975-76 a program for students with little, or no, proficiency in English was funded. Its English reading component used the Formula Phonics System. During its first year the English reading component of this Bilingual Project has also exceeded project objectives.

Mountain View Senior High School Profile

Mountain View High School, one of four four-year comprehensive high schools in the El Monte Union High School District, was established in 1971. The school serves a lower-to-middle income community. Occupations of the school patrons include mainly blue and white collar workers, with some professional heads of households. Approximately 20% of the students enter four year or junior colleges, with the majority of graduating students entering the job market or the military.

The campus is a well planned, modern facility, built on a 49 acre site. The certificated staff numbers 70 and in April 1976, twenty-seven staff members held master's degrees. At that time 24% of the faculty members were from ethnic minority groups. The administrative staff consists of the principal, three full-time assistant principals, five full-time counselors, and a coordinator of Child Welfare and Attendance. Support servides are provided by a classified staff of 62, 50% of whom represent minority ethnic groups.

Ethnic Distribution—April, 1976

White/Not Spanish Surnamed 464 (30%); Spanish Surnamed 1005 (65%); Other Minority Groups 77 (5%). Total Enrollment 1546. Combined Minority Students 1082 (70%).

Funding

District, Title I of E.S.E.A., and California State S.B. 90 and A.B. 2284

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